

POTENTIALS OF SOYBEAN IN IMPROVING AGRICULTURE FOR PRODUCTIVITY, NATIONAL GROWTH AND DEVELOPMENT: A REVIEW

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Abstract

A nation that feeds its population, solve the problem of hunger, malnutrition and diseases; which are prevalent among children in a developing country and which can be considered as some of the factors that can hinder production, growth and development of a nation. Such nation saves money for other goods and services. A nation that depends on importation of food for her population will certainly be bankrupt especially now that there is global economic down turn. It is only through agriculture that man can eat. For growth and development of any developing country, a lot of emphasis and provisions are made towards improvement of agriculture. Based on this premise, soybean is such a plant of great agricultural importance. Soybean is a legume that occupies greater position in world agriculture by virtue of its high protein and oil content, and its capacity for fixing atmospheric nitrogen. Some of the uses of soybean include, provision of food, raw materials, health care delivery services among others. This paper thus reviewed the potentials of soybean in improving agriculture, which is one of the 7-point agenda of the present administration. Recommendations were made on the way forward.

Introduction

Soybean (*Glycine max (I) meril*) belongs to the family, Leguminose and it is considered as one of considerable dietetic, industrial, medicinal and economic importance (INTSOY, 1989). Consequently, their has been an increase in soybean production. Soybean was introduced into Nigeria as early as 1908; but its cultivation as crop can be attributed to the introduction of the Malayan variety in 1937 by British Colonial Officer in Benue State (Singh *etal*, 1987). Excellent soybean research to improve the existing soybean varieties to expand and increase production, was initiated in both different research institutes and universities, such as National Cereal Research Institute (NCRI), International Institute of Tropical Agriculture (IITA), University of Agriculture Markurdi (UAM), Obafemi Awolowo University (OAU) among others. The present developmental status of soybean is in development of varieties that can be grown successfully in the Eastern part of the country, where acidity is a problem; that are high yielding, early maturing and capable of nodulating in association with local rhizobia; that possesses other good agronomic traits (IITA 1994).

In Nigeria the major producing areas of soybean are Benue, Kwara, Kogi, Oyo, Osun, Nasarawa, Kaduna, Niger, Bauchi, Ogun and Taraba. Other producing areas are Adamawa, Jigawa, Sokoto, Kebbi, Zamfara, Lagos, Plateau, Ekiti and Federal Capital Territory; where small scale farmers have been growing soybean for about 50years. Soybean grows best in areas where the minimum and

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maximum temperature prevails in tropical regions, between 12oN and 72oS (RMRDC 2004). It can grow in a wide variety of soils ranging from predominantly sand and predominantly clay and acidic to basic (P^h 5.0-8.0). The factors affecting production of soybean include the input limitation, poor pricing of agricultural products, inaccessibility of credit facilities to majority of farmers, poor storage facilities and lack of infrastructure facilities (RMRDC 2004). The importance- of soybean ranges from milk production and processing, livestock feeds, industrial uses and human consumption (Addo and Oguntona 1993). The nutritional quality of their products like oil and cake, makes the crop a more desirable raw material in food formulation. Soybean, by virtue of its high protein content and capacity for Fixing atmospheric nitrogen, occupy greater position in world agriculture. This paper thus reviewed the potentials of soybean in improving agriculture in Nigeria for growth and development, especially now that the focus is massive food production; which is one of the 7-point agenda of the present administration.

Potentials of Soybean

Soybean is a suitable food of great nutritional value. Soybean is probably the world's most valuable crop, used as food by billions of livestock, as "a source of dietary protein and oil by millions of people; and in the industry for manufacture of thousands of products. The crop is extremely rich in protein and oil, and is such a good source of energy, vitamins and minerals (Nwokolo, 1996). Comparing with other legumes and cereals, soybean (*Glycine max (I) merill*) has been observed to be the cheaper source of both quality proteins (Johnson, 1975; IITA 1994; Osodeke 2001). Osho and Dashiell (1998) reported that soybean which has less purchasing cost, has about 40% protein, 30% carbohydrate, 20% oil and 10% mineral. With a high quality protein content, high quality oil, and good percent of vitamin C, that most legumes lack, soybean is a good raw material for animal production and industries (Peter, 1989; Lui, 1995).

Soybean has been found to be excellent for a number of different conditions such as high blood pressure, diabetes-related diseases and many others. It is very useful in improving the diet of malnourished children and revitalizing heart and breast cancer patients and has no cholestrol (Enwere 1998). Soybean can be used as a nutritional supplement for pregnant women, lactating mothers and children.

Potentials of Soybean in Agricultural Improvement for Growth and Development

Agriculture is the cultivation of the land for the purpose of producing food for man, food for animals and fiber or raw materials for our industries. It also includes the processing and marketing of crops. Soybean is a grain legume that occupies greater position in world agriculture by virtue of its high protein content and its capacity for fixing atmospheric nitrogen. The crop is produced, processed and utilized today in many forms and formulations like paste, juice,

Potentials Of Soybean In Improving Agriculture For Productivity, National Growth And Development: A Review

cake, milk, chocolate, fibre, paint etc. These are used for human consumption, livestock feed, raw materials for food and pharmaceutical industries, and for cash. Potentials of soybean leads to greater improvement in agriculture by its remarkable contributions in meeting up with some demands of population on agriculture in any developing country like Nigeria. These demands include among others:

- Provision of food for the teeming population.
- Provision of raw materials for industries
- Generation of income for farmers
- Provision of employment for the working population
- Improving fertility of the soil for maximum crop yield
- Health care delivery or services.

Provision of Food for the Teeming Population

A nation that depends on importation of food for her population will certainly be bankrupt. Soybean is a good source of protein and oil; used as both food and medication. Soymilk, with a high level of protein content, has been found to be the most economic substitute to imported animal milk which has become very costly. It serves as a good substitute to coast bean in preparation of 'dawadawa' (local maggi); and used in place of melon in soup. Strongly roasted and grounded seeds are used as coffee substitute (Falliola 1990). Oil in the seed can be cooked and used as dressing salad, manufacture of margarine and vegetable oil with no cholesterol. Seeds can be grounded into flour and added as cereal flavour, roasted and eaten as peanut-like snacks, processed into paste and milk for infant nutrition.

Provision of Raw Materials for Industries

Soybean seeds are useful materials for food industry for they are rich in oil and protein with good nutritive value. Industrial and domestic processing of soybean has given rise to numerous products utilized for both human and animal consumptions. Soybean products also serve as raw material in paint, pharmaceutical and confectionary industries. These products include:

- * **Soybean meal:-** Used as a supplement in poultry feeds and cattle feed.
- * **Soybean oil:-** Used as edible oil; refined to produce paints, varnishes, soap, lubricants, Sealants and in pharmaceuticals.
- * **Lecithin:-** used in oil and chocolate industries.
- * **Soybean curd:-** Used in vegetarian cooking.

The nutritional goodness of soybean is also fully utilized in other food processing operations for producing weaning foods. The market for weaning food is largely dominated by Nestle Food Plc, one of the multi-national companies operating in Nigeria. The company produces weaning foods from

maize and soybean. The technology being used by this company allows for the use of the whole dehulled soybean. The quality of the product is standard and has been used by generations of Nigerian children.

Generation of Income

The protein and oil content of soybean determine the economic worth of soybean seed. Soybean is commonly processed into commercial purposes. There are products like soybean oil, soybean milk, extrusion cooking, soy ogi, soy cake etc. These products command the most commercial attention and are sold for cash by farmers. Workers and labourers used for producing, processing and marketing of the products are paid their wages and salaries.

Sources of Foreign Exchange

Through the export of agricultural products, a nation can earn foreign currency. The foreign exchange can in turn, be used to purchase goods necessary for improvement of agriculture for national growth and development. Nigerian soybean has been reported as one of the best quality soybean in the world. Its quality is said to compare favorably with 'yellow gold'; the United States of America's variety (RMRDC 2004). According to RMRDC (2004) the major international buyers are the countries in the West African sub region: Niger Republic, Chad etc, whose climatic condition does not favor the cultivation of soybeans. Other consuming countries are Netherlands, United Kingdom, Turkey, France, Poland, Romania, Czech Republic and Saudi Arabia.

Provision of Employment for the Working Population

Agriculture and other agro-based industries provide employment opportunities for up to 60-70% of the population. Soybean production and industries engaged in the processing of soy products, provide employment opportunities for a good number of the population. The production and processing of soybean, developed into a commercial venture, will ensure ability of those employed under it to produce enough to feed the country and allow for export.

Improving Fertility of the Soil for Maximum Crop Yield

Soybean is generally acceptable to be capable of fixing nitrogen in association with *Rhizobium japonica*. The amount of fixed nitrogen remain in the nodules and is released to the soil, to increase nitrogen content of the soil. Researchers have reported maximum increase in yield of cereals planted in soil where soybean is planted the previous season; which in part was as a result of increased nutrient content of the soil, which is one of the major determinants for increasing crop yield and yield components; thereby encouraging agriculture in Nigeria.

Potentials Of Soybean In Improving Agriculture For Productivity, National Growth And Development: A Review

Health Care Delivery or Services

One of the determinants of growth and development of any nation is the reduction of diseases and illnesses which can hinder growth, productivity and development. A lot of soybean and soybean products can be utilized and consumed as drugs in the treatment of certain diseases and illnesses which may cause death. Duke (1983), Ayensi and Duke (1985), reported treatment of snake bite with bruised leaves of soybean; blindness and opacity of the cornea with flowers and immature seed pods; healthy functioning of bowels., heart, kidney, liver and stomach with the seeds as antidote. Soybean constituents has been used for the cure of hypertension; reduce risk of heart diseases, developing coronary osteoporosis, and alleviation of menopause symptoms. Consuming soybean in diet has reduced cancer risk and in a limited number of study, found to have significant reductions in both diastolic and systolic blood pressure and diabetes. It also helps people to stay lean, and reduce obesity (Fabiya 2006).Soybean has also been shown to promote serum insulin production (Fukushima, 2000).

Soy protein helps to improve cholesterol profile. It is particularly important in post menopause years because it prevents hip fractures; reduce fat development, especially abdominal fat (Anderson 2003). In areas of the world where soybeans are eaten regularly, rates of colon cancer as well as some other cancer including the breast cancer tend to be low. Soybean may be the most practical means of relief from kwashiorkor (protein calorie malnutrition) which is increasing in prevalence among children in many parts of a developing country.

Conclusion

A developed country, is the one that can solve its problem of hunger, malnutrition, diseases and illness, to maintain long life and healthy health. From the foregoing account on potentials of soybean, the house wife can vary her dishes by replacing meat, fish, cow milk etc partly or entirely with the low cost and improve nutritive value of some diets. Soybean holds promise as a main source of protein for the future, in many countries, including Nigeria and the number of malnourished children have been reduced through its consumption. The nutritional quality of oil, protein and cake make soybean a more desirable raw material in food and pharmaceutical industries for manufacture of different soy products utilized, consumed as food, feeds, and drugs on marketed for cash. The production and processing of soybean and soybean products and all the industries engaged in; provide employment to a good number of the population and a lot of diseases and illness has been reported to be treated with soybean. In addition, soybean enriches soil fertility by its ability to fix atmospheric nitrogen and releasing nitrogen nutrients to the soils thereby improve yield of other crops.

It may therefore be concluded that the potentials of soybean encourage growth, productivity and development of a nation, since the production, procession and utilization of soybean and soybean products provide employment opportunity to a great number of the population, encourage and improve crop yield, provision of food, feeds, drugs for both human and animal consumption

M. O. Umeh and J. N. Achufusi

and for cash. Furthermore, soybean help minimize poverty, hunger, malnutrition, disease and illness; prevalent among a greater number of population in a developing country, like Nigeria. Therefore the massive production of soybean in this country, will not only provide a nutritionally balanced food for the large population at a very low cost, it will also help actualize the dream of the agricultural sector, in the 7-point agenda of the present administration.

Recommendation

The following recommendations are therefore made:

1. Effort should be made by the State and Federal Governments to encourage farmers by granting agricultural loans.
2. The agricultural extension services should create awareness to farmers in rural areas.
3. Government and farmers should embark on mass production of soybean.
4. Both Federal and State Governments should subsidize processing and utilization of Soybean to facilitate more production and use.
5. Both Federal and State Governments to provide fertilizers to soybean farmers at subsidized rate.

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Potentials Of Soybean In Improving Agriculture For Productivity, National Growth And Development: A Review

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