REVIEW ARTICLE

REVIEW ARTICLE ON STATUS OF SOYBEAN PRODUCTION IN NEPAL

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ABSTRACT

Soybean is the major oilseed crop cultivated during Kharif season in most of the areas of our country. Soybean are high in protein and a decent source of both carbs and fat. They are a rich source of various vitamins, minerals, and beneficial plant compounds such as isoflavones. This short review article analyses the previous works and studies about production of soybean and reason for decrease in production of soybean. Long time research work which was conducted in several locations has shown that various reason like biotic stresses, diseases, insect pests, weeds and many more. So, this article highlights about the status of production of soybean and provides necessary adoption for enhancing productivity of soybean.

KEYWORDS

Soybean, Significant, Production.

1. INTRODUCTION

The soybean or soya bean (*Glycine max*) is a species of legume native to East Asia widely grown for its edible bean which has numerous uses like soy milk, soy sauce, fermented bean paste. Soybean is an herbaceous annual plant in the family Fabaceae grown for its edible seeds. Soybean is an important source of food, protein and oil and hence more research is essential to increase its yield under different conditions. The most important countries of the world with highest rate of soybean production include the USA, Brazil, Argentina, China and India. The total world production for soybeans is 348,712,311 metric tonnes (FAO,2018). In case of Nepal, it is grown in 29282 ha with production and productivity of 28270 Mt and 965 kg/ha respectively (ABPSd,MoAD 2011/12).

Soybeans, production quantity
Nepal

Figure 1: Production quantity(tons) of soybean for Nepal

Source: Using data of FAOSTAT

Figure 2: Soybean Production in world

Source: Using data of FAOSTAT

Soybean seed contains high protein (40-45%), 20% oil and rich in vitamins B,C,E and minerals and also used as green pods, soybean oil, roasted grain, green manure, animal feed and industrial products (Shrestha et al., 2011). Soybean is a valuable ingredient in formulated feeds for poultry and fish. Its nutrition value in heart disease and diabetes is well known. Soybean oil is used in cooking and frying foods. Biodiesel fuel for diesel engines can be produced from soybean oil by a simple process called transesterification. Soy products are also found in many popular brands of home and commercial carpet, and in auto upholstery applications. Candles made with soybean oil burn longer but with less smoke and soot. Even though there are various significant of soybean but production of soybean is drastically decreasing in Nepal.

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2. CONSTRAINTS TO SOYBEAN PRODUCTION

2.1 Lack of systematized marketing

According to the data kept by the Department of Customs, Nepal exported soybean oil worth Rs 2.27 billion in the first month of the current fiscal year. India is the major market of soybean oil produced in Nepal. Nepal's soybean oil exports amounted to Rs.12.69 billion in two previous year. According to Ministry of Agriculture and Livestock Development, Nepal imports soybean worth Rs. 7.5 billion in the past five months. It had spent Rs. 18.15 billion and Rs.16.97 billion in the import of soybean oil in two previous years. As we can see import of soybean is more than export which is due to lack of proper market for soybean. Even if there is proper marketing facilities, producer doesn't get right price and also couldn't recover from their production cost.

2.2 Various diseases observed in Soybean

Each year significant disease problems affect soybean production in Nepal. Viral Diseases of Oilseed crops (Soybean) The most common virus is soybean yellow mosaic virus among the 3 virus diseases of soybean that were found in Nepal (Manandhar and Sinclair, 1982). Soybean mosaic (SMV) and bud blight (tobacco ring spot virus, TRSV) in soybean in Kathmandu valley and terai region was reported by (Manandhar, 1979). A group researcher reported 6 genotypes PI 94159, G-8754, Dashratpur, SB 0095, CM 9125 and TAMPOMAS were found highly resistance to Mungbean yellow mosaic virus (Gharti et al., 2010; Shrestha et al., 2011). Many farmers are uneducated and they are not well-informed about preventive measures to control these diseases so, they are not able to produce soybean in required amount.

2.3 Weeds

Various weeds like *Echinochloa crusgalli*, *Setaria glauca*, *Setaria viridis*, *Digitaria sanguinalis*, *Panicum capillare*, *Chenopodium album*, *Amaranthus artemisiifolia*, *Solanum nigrum*, *Cynodon dactylon*, *Agropyron repens*, *Cirsium arvense*, *Lathyrus tuberosus*, etc are present in soybean field competing for better food, nutrients and space. If these weeds aren't control in time then these weeds grow in large number by occupying maximum space where soybean can be grown.

2.4 Biotic stresses

Yield reduction of soybean is often caused by different environmental stresses like salinity, high temperature, chilling, water logging, metal toxicity, pollutants, ultraviolet radiation and so on. UV radiation causes growth inhibition, morphological changes, inhibition of photosynthesis and change in level of pigments. Pollutants like O₂ Sulphur dioxide causes acid rain that directly damage leaves and induce oxidative stress. These stressors adversely affect the plant performance by disrupting the cellular functions and metabolic activities.

2.5 High risk in production due to severe drought

Drought stress is the most devastating of the environmental stresses, affecting the productivity upto 40% (Le et al., 2012). The main causes of drought are low humidity in the atmosphere, high temperature and water deficiency (Hirt and Shinozaki, 2004; Szilagyi, 2003). The effects of drought on soybean have been extensively reported, including morphological changes of the vegetative plant and the reduction in seed quality and quantity. A 2-year field study conducted on 3 soybean cultivars of Maturity Group (MG) IV, V and VI respectively in the southern U.S.A. reported a reduction of seed germination to less than 80% of the control, when drought stress was applied at any tested reproductive stages.

2.6 Unavailability of quality seed/Lack of organized seed production

Seed security is a prerequisite for food security of small holder farmers. Seed security is when farmers in the country have access to quality seeds at the right time and at reasonable prices which is not possible in developing countries like Nepal. The imported seeds from foreign countries are not of good quality and seed certification process is not

conducted properly so that genetic identity and purity of imported seeds is also not maintained. Farmers can't get more profit as they have to spend more money on buying imported seeds and they can't take risk for the production of soybean.

2.7 Lack of research activities

Research Achievements in Soybean:

- Promising genotypes LS-77-16-16, Karver local, F-
- Promising genotypes LS-77-16-16, Karver local, F-778817, TGX-311-23D and IARS-871, Iang Beakong, G 4504 and G 1871 (grain yield of 1.5 to 2.0 t/ha).
- Genotypes CM 9125, G 8754, LS-77-16-16 and SB0065 were resistant to mungbean yellow mosaic virus (MYMV).
- 2:1 (soybean at both sides of maize rows spaced at 1 m apart with or without topping of maize plant at physiological maturity) and 1:2 (single row of soybean between 2 rows of maize spaced 1 m apart) were superior than local method (1 row of soybean in between 2 maize rows) Above are the only research work that is done in Nepal regarding soybean. And there is various research work that needs to be done to increase yield of soybean but is not happening due to low budget, less interest of researcher, low priority in national policy, no governmental support and so on.

2.8 Viewed as secondary crops

Despite various importance of soybean, they are considered as secondary crops as greater importance are given to cereals crops. Soybean has low stability in production and higher losses in storage in comparison to cereal crops. And also, the market prices of these soybean keep fluctuating so, first priority is given to cereal crops as it has better market and more profitability. Farmers consider soybean to be more sensitive to diseases, pest and weather condition so, high yield is not assured. So, it is considered as secondary crops.

3. POSSIBILITIES FOR IMPROVING PRODUCTION OF SOYBEAN

It may not be possible to expand the production area of soybean but there are always possible ways for enhancing production and productivity by using improved varieties and improved production technologies. Improving production input supply system, establishing collection centers at production areas, promoting contract farming and developing storage and marketing facilities near production pockets will help a lot to increase yield of soybean. To increase production and marketing of these crops, government should act as the facilitator to establish co-ordination between feed manufacturers and farmers.

Farmers should be empowered to strengthen their bargaining power in making contracts and determining prices of their produce goods. Crop production planning should be integrated with marketing. Feed manufacturers should be assured of the regular supply in required volumes at reasonable price and acceptable quality. If the feed producers can collect their requirement from a single procurement point, the cost of collection and marketing will be reduced. Since soybean are the major food and feed ingredients, we need to streamline the supply of these soybean products for the feed processing industries. If all the above methods are applied effectively and efficiently then only production of soybean can be increased.

4. CONCLUSION

To sum up, the review paper emphasizes on the production of soybean and significance of soybean. With the increasing population, high production of soybean and other legumes crops can minimize the pressure of food insecurity all over the world especially in developing countries like Nepal. Use of FYM, manure, appropriate number of chemical fertilizers, quality seeds, advanced machineries and so on can increase production of soybean. Nepal has a great potential to produce different soybean species because of diverse agro-ecological environments. Hence there is further scope to increase area, production and productivity of soybean through

development and popularization of suitable varieties and technologies, streamlining community-based seed production, addressing climate change issues and policy reforms for the promotion of soybean.

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