

# “The rise of global soybean production, and Top most producing countries in the World”

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## **Abstract:-**

Soya bean originated in Southern country of Asia and were first domesticated by Chinese farmers around 1100 BC. By the first century A.D, Soybean was grown in Japan and many other countries, soybean seed from china was planted by a colonist in the British colony of Georgia in 1965.

Soybean originated from china, in 2853 B.C. Emperor Shang Nurg of china named fine sacred plant's soybean, rice, wheat, barhopped millet. Soybean plan were domesticated between 7<sup>th</sup> and 11<sup>th</sup> century BC. In the eastern half of china where they were cultivated into a food crops. From about the first century Ac to the Age of Discovery. (15-16<sup>th</sup> century) soybean were introduced in to several countries such as Japan, Indonesia, the Philippines, Vietnam, Thailand, Malaysia, Burma, Nepal, and India. The spread of the soybean was due to the establishment of sea and land tread routes, the earliest, Japanese reference to the soybean is in the classic kojiki (Records of Ancient matters) which was completed in 712 Ac. The first soybean arrived in America in the early 1800's was ballast aboard a ship; It was not until 1879 that a few brave farmers beg ant to plant soybean as forage for their livestock. The plank flushed in the hot, humid summer weather characteristic of the north eastern North Carolina, around 1900 Ac U.S. department of Agriculture was conducting test on soybeans and encouraging farmers to plant them as animal feed.

## **Key words.**

Soya bean, Genetic, Improvement, Genetic resources Rain fed area, Harvest, Potential and Ecosystem.

## Introduction:-

The start of commercial exploitation of soybean in world is nearly twine decades old (In India nearly six decades old). In this period, the crop has shown unparallel growth in area production, soybean has established itself as a major rainy season crop in the rain fed area agro ecosystem of central and peninsular world level introduction of soybean has resulted in an enhancement in the creping intensity and resulted increase in the profitability per unit land area, In the world level soybean his continue to remain a major rain fed oil seed crop. A number of varieties that have been bred have been resulted in this unprecedented growth. The simultaneous studies and on farm demonstrations indicate with current varieties the rain fed potential of soybean in world is about 2.1 tons per hectors against the world level average productivity of just 1.2 tones per hectors, hence large yield gap's exist between the potential and the actual yields harvested the farmer No moving of this yield gap many lead to doubling of soybean production.

Successful in meeting the research demand for agriculture and industrial community, further improvement in the yield of soybean grain and quality of soybean oil are possible by urge of new research methodology and exploitation of recent advances in biology.

Soybean is a recognized as one of the premier crops around there world it's a major sources of vegetable oil, protein and animal feed Due to higher protein content (740%) and high oil content (720%), soybean is considered to be an important food commodity . The soy protein is called complete protein because it supplies sufficient amount of amino acids soybean oil contain no cholesterol.

In 1904 the famous American chemist, G.W. carver discourse that soybean are voluble source of protein and oil, the encourage farmers to rotate their crops with soybean. To surprise of farmers, this produces better crops.

In 1929 mares spends two year researching soybean in china where be gathered mare that 10.000 soybean verities. It was not until the 1940's that farming of soybean really looking off in America.

Although soybean is native to south Asia countries are produce 55 percent of production is in the United States. The U.S. produced 75 million metric tons of soybean in 2000, of which more than one third was exported, other leading producers of soybean are Argentina Brazil, China, and India, much of the US production is either fed to animals or exported through US consumption of soybean be people has been increasing. Brazil is expected to becomes the worlds Biggert soybean exported 2004, displacing the united states from the seat.

Soybean is one of the crops that are being genetically modified. Since 1997 G.mo soybean are being used in all increasing number of products. There's a lot of controversy around Gmo- soybeans. However Gmo soybean has never caused any harm to people. The possible negative aspect of Gmo is more environmental and economic nature dependence of farmers on a few multinationals contamination of wilds plants. Soybean production in million metric tons'

#### From 2013-14 to 2017-18 periods

Name & Year	2013-14	2014-15	2015-16	2016-17	2017-18
<b>USA</b>	<b>91.39</b>	<b>106.89</b>	<b>106.93</b>	<b>117.21</b>	<b>120.49</b>
<b>Brazil</b>	<b>86.7</b>	<b>97.2</b>	<b>96.5</b>	<b>11.4</b>	<b>107</b>
Argentina	<b>53.4</b>	<b>61.4</b>	<b>56.8</b>	<b>57.8</b>	<b>57</b>
<b>China</b>	<b>11.91</b>	<b>12.15</b>	<b>11.6</b>	<b>12.9</b>	<b>14</b>
India	<b>9.5</b>	<b>8.71</b>	<b>7</b>	<b>11.5</b>	<b>10</b>
Paraguay	<b>8.2</b>	<b>8.15</b>	<b>9</b>	<b>10.59</b>	<b>9.4</b>
Canada	<b>5.4</b>	<b>6.05</b>	<b>6.04</b>	<b>6.46</b>	<b>8.2</b>
Other	<b>16</b>	<b>19.2</b>	<b>18.9</b>	<b>20.19</b>	<b>22.24</b>

Sources – Statistic portal (2016-17)

#### Statistic and student from more them 18.000

The statistic shows the leading countries in soybean production worldwide from 2013 to 2016-17, and provides a far cost for 2018, in 2015-16 the

United States was the leading soybean producing country with a productions. As a September 2017, the production of soybean in the U.S. was forecasts to reach some 120.59 million metric tons in 2017-18.

Soybean Production spread though oil world.

Soybean (*Glycine max* L. menial) is the world's most important seed legume. Which contributes 25% of the global edible oil, about two thirds of the world protein concentrate for livestock feeding soybean meal is a value ingredient in formulated feeds for poultry and fish. The cultivation and lore of soybean could be elated back to the beginning of china's agricultural age. The china's medical compilation dating back 6000 years mention its utilization of human consumption. To the popular ace of china. Japan. Koria, Manchiciri, phillippines and Indonesia fro countries, soybean has meant the to be meat milk, cheese bread and oil. This could will be the reason why in their countries, It has earned epithets like "cow of the field" or "Gold from soil owing to its omino acids Composition. The protein of soybean is called a complete protein, Its nutrition value in heart disease and celibates is well known. It is significant that Chinese infants using soybean milk in place cow's milk are practically free from rickets. Today USA, Brazil and Argentina are the "Big 3" producer of the world veracity of soybean was recognized in there was quite seventhly. Around 1921, china produced about 50% of the world's soybean, in tenth century AD through the Himalayan routes, and also brought in via Burma [Now Myanmar] by traders from Indonesia. As a result, soybean has been traditional grown on a small scale in [Himalaya] Himachal Pradesh the kuman hills of Utter Pradesh ( Now Uttaranchal).

At present India's rank fifth in the area and production in the world soybean area grain is only 4% implicating the poor levels of productivity of the crops in India (1.1 ton/ ha) as compared to other countries and world average 2.2 ton/ha.

**World area, production and productivity of soybean**

Country	2009-10			2010-11			2011-12		
	A	P	Y	A	P	Y	A	P	Y
USA	30.91	91.42	29.56	31.0	90.61	29.22	29.80	83.17	27.90
Brazil	21.25	57.35	26.37	23.32	68.71	29.48	25.00	72.00	28.80
Argentina	16.77	30.99	10.48	18.13	52.68	29.05	18.60	48.00	25.80
China	9.19	14.98	16.30	8.52	15.08	17.71	7.65	13.50	17.60
India	9.73	9.97	10.24	9.65	12.74	13.34	9.95	12.57	12.66
World	99.27	223.29	22.49	102.56	264.99	25.84	103.29	251.67	24.70

Source – FAOSTAT- March-2012

A = area (m.ha)    P = production (m.t.)    Y = yield (kg/ha)

World level soybean production and area the top 5 soybean producing countries in world

Sr.No.	Country	soybean production	% of world total
1	United State	91.389.330 ton	32.8%
2	Brazil	81.724.477 ton	29.3%
3	Argentina	49.306.200 ton	17.7%
4	China	11.950.500 ton	4.2%
5	India	11.948.000 ton	4.2%

Source FAOSTAT data – 2016

Data is the top 5 soybean producing countries in metric tone's for the year of 2013. Which were the latest available data as of June 2016. This top 5 list many include official, semi official or estimated data gathered on soybean production by the food and Agriculture organization of the United States.

The soybean production in world level as well as nation's level increased increasing rate soybean by production also increases from 2005 to up to data. The production of soybean increased five times's compared to 2005 to 2016, the rise of global soybean production.

The soybean industrial is beginning to place itself as one of the leading crop in the grain and oil seed in density. Soybean production is rising annually matched with a rise in global demand.

The latest estimates by the USDA. Indicate that world soybean production is likely to increase to 345 million tons in 2017/2018 season. This is a 10.1% increase in last two years. In the world Agriculture supply and demand Estimate report (WASDE) the USDA indicate that the 2016/2017 soybean production is likely to have been the largest crop in a decade, currently sitting at an estimated 348 million tons.

The key delivers in the increasing soybean production are the United State of America (USA) Brazil and Argentina, who collectively contribute 81% percent to the global soybean production. USA alone is set to produce 45% share of the global production, meanwhile Brazil and Argentina account 31% and 17% respectively china, who is along among one of the largest soybean producers, has gained the status of the leading imported of soybeans. Soybeans imports to china have shown an increasing trend over the years and are expected to increase to 93 million tons in 2017/2018 compared to 82 million tons in 2015/2016 season.

### **Local Production:-**

Locally, soybean production is also on the rise, South Africa which is leading soybean producer managed to harvest 106 million tons of the soybean in



2015/2016 season. Which was considered a record of crop, however, in the latest crop estimated reported by the crop estimate committee, soybean production for the 2017-2018 season is estimated to reach 1.2 million tons an increase of 66% from the 2016/2017 season.

It is worth noting that based on the estimated 2017-2018 record production of 1.2 million tons South Africa would not require any imports meanwhile export could increase by a marginal 4.5%. In this case, it is clear that South Africa is likely to move away from the status of net importers of soybean, given the emerging production trend.

Based on the rise trend of soybean production, it is evident that global soybean supplies have expanded strongly in recent years and plantings are likely to trend up to new highs in years to come. World production is also expected to increase underpinned by easing demand for high-protein meals.

**Source – crop Estimates committee – 2017**

### **Top 10 countries are the largest soybean producers in the world.**

Soybeans have been cultivated in Asian civilization for thousands of years and are one of the most important food crops globally today. These legumes can be classified as legumes, oil seeds, vegetables, or even fuel sources depending upon how they are used. Soybeans are also one of the few plants that have a full array of amino acids in their proteins composition to be considered “Complete” protein on par with meats, milk products and eggs. Commercially important products commonly made from soybeans include protein powders, textured vegetables (powder), protein, soybean vegetable oil, edamame, soybeans, sprouts, livestock feed, gluten-free flour, not to mention tofu, soy milk, soy cheese and curds and much more. Though originating in Asia, many countries. 7 of the top 10 producers today are found in the New World. Soy products have also been shown to be beneficial in reducing the risk of certain diseases including heart disease and certain cancers. On the other hand, many individuals live with an allergy to this important legume.

**I) USA (108.0 million metric tons)**

In the US. Soybean are the dominant seed and account for 90 percent of the nation's oil seed production, according to USDA. That is an agricultural commodity crops that also includes canola/ rapeseed, sunflower, and flax seeds as all of these are produced into vegetable oils. The US accounts for 34 percent of the world's soybeans production. At 42 percent market share it's also the largest exporter of raw soybeans according to commodity Basis. There are around 34.4 million hectares devoted for the planting of soybean in the US Kentucky , Minnesota , Ohio, Pennsylvania and Wisconsin are the states with the largest soybean plantation in average size meanwhile Illinois , Iowa , Indiana, Minnesota and Nebraska were the state producing the largest soybean yields unlike other soybean producing countries prices in the US are more significantly determined by increased bio-diesel demand. Where the soy oil is used to fuel combustion engines. Annual production of soybean in these seasons leading up to 2014-2015 has ranged between 82.8 and 108 million metric tons planting of soybean in much of the US start in May or early June and harvesting commences in late September to October .

**2) Brazil (86.8 million metric ton's)**

As the second largest producers of soybean in worldwide Brazil account for 30 percent of the global production of the crop. The country has over 29 million hectares of land available and used for farming soybean. In the 4 most recent growing seasons up to 2014-15, soybean production has been on a steady rise according to USDA. Annual production quantities in that time span have ranged from 65.5 to 94.5 million metric tons. In 2013, soybean exports earned the country \$23 billion USD according to MIT data soybeans grown in Brazil have higher protein levels than grown in many other parts of the world and thereby fetch higher prices in international markets according to commodity basis. The country also produces a large quantity of non-genetically modified (non-GMO) soybeans which are also priced higher than genetically modified ones.



### 3) Argentina (53.4 million metric tons)

Argentina has farmlands of over 20.3 million hectares dedicating to growing soybeans. Buenos Aires, Cordoba and Santa Fe are the states where soybean are growing in largest quantity according to the commodity basis. The country accounts for 18 percents of the world's soybean production. Though Argentina export only 7 percent of global raw soybean exports its biggest exporter of soybean oil and meal in 2013 soybean meal was. Argentina's single largest exporting commodity earning the \$10.7 billion, according to MIT data in the four most recent soybean seasons in Argentina up to 2014-15, annual production has been in the range of 40.1 to 56 million metric tons according to the USDA.

### 4) China ( 12.2 million metric)

China accounts for 4 percent of soybean production in the world according to commodity basis much of the country's soybean are grown in the northern Heilongjiang province, near the Russian border. According to the province's Agriculture commission there are over 235 million hectares used as soybean farmland in the province still china has to import large amounts of soybean to meet the domestic demand. China account for 60 percent of world's soybean imports, according to commodity basis making it the largest import of soybeans followed by the collective members of the European Union. Much of the prices in the world market for soybean are dictated by china's demand for the large six planting season up to 2014-15, annual production has ranged between 12.2 to over 15.08 million metric tons there, according to the USDA.

### 5) India (10.5 million metric tons)

India is Asia's second largest producers of soybean and its accounts for 3.95 percent of global production according to statistic. From the 2004-05 season in the 2012-13 season there has been a compound annual growth rate of 9.6 percent of soybean production of Indian chambers of commerce and Industry (Ficci) Annual production for these seasons up to 2014-15 had ranged from 9.5 to 12.2 million metric tons annually. In India the states of Maharashtra and Madhya Pradesh

account for 89 percent of the country's total production according to the Ficcl. Most of the rest is produced in Rajasthan, Andhra Pradesh, Karnataka, Chhattisgarh and Gujarat in 2013. Soybean meat exports alone earned the country's \$2.7 billion USD. To keep up with increased demand the country has embarked on efforts to raise soybean yields by introducing new technologies for cultivation.

#### **6) Paraguay (10.0 million metric tons)**

Paraguay accounts for 3 percent of the worldwide soybean production according to a 2016. Commodity basis repasts in recent seasons soybean production has increased as more land is allocated to it for its cultivation in Paraguay. According to the USDA, in the past two decades land dedicated to soybean cultivation has increased steadily at an average rate of 6 percent annually. Currently there are over 3.1 million hectares of Paraguayan land where soybean production is carried out. The USDA projects that over the next 5 to 10 years land for soybean production there will have grown to 4 million hectares. Soybean from Paraguay is exported to the E.U., Russia, Egypt, Turkey, Mexico and Brazil after first passing through Uruguay and Argentina. In 2013 according to MIT data Soybeans were the country's top export, bringing in \$2.41 billion USD.

#### **7) Canada (6.0 million metric tons)**

In Canada, annual soybean exports alone garner the nation over \$1 billion USD. According to Agricultural and Agri-food in Canada in recent years Annual production has been on a steadily increasing trend. In 2014 over 6 million tons were harvested which was itself an increase of 12.9 percent from 2013 totals according to statistics Canada. In the same period, land for soybean production has increased to 5.5 million hectares 70 percent of soybean production in Canada are grown in the Quebec and Ontario province and almost two thirds of them are exported either raw or processed to Japan, the Netherlands and southeast Asia country the U.S. Europe and middle east. Collectively according to soy production in Canada.

**8) Ukraine (3.9 million metric tons)**

The Ukraine is the largest producers of soybean in Europe and the 8<sup>th</sup> largest in the world. Half of the soybeans produced in the Ukraine are exported. Annual production has steadily been on the rise in recent years. During the 2014-15 Season the country produced 3.9 million metric tons, an increase from the 2013-2014 season when production was 2.774 million metric tons, according to commodity basis. Soybean plantation in the Ukraine has also increased in recent years due to rise in export demands for the oil seed. In the year 2000 Ukraine soybean were cultivated on 65,000 hectares but by the 2015 that figure had slashed about 2.1 million hectares, according to the Ukraine soybean congress.

**9) Bolivia (3.3 million metric tons)**

The soybean is the most treasured crop in Bolivia and it is largely produced in the Santa Cruz region. According to the USDA, it accounts for 3 percent of the country's gross domestic product and employs 45,000 workers directly. While generating 65,000 more jobs indirectly. There are about 14,000 soybean producers in Bolivia. Depending on the agronomic practices applied and the soil and weather conditions yields per hectare may range between 1.8 and 2.3 metric tons in 2014 according to FAOSTAT. The country produced 3.2 million metric tons of soybeans. But in 2015 according to the USDA, Bolivia soybean production had dropped to 3.1 million metric tons. This was due to drought which affected 12 percent of the 1 million hectares in the production region. In 2013 soybean was the number 3 export for Bolivia earning the country \$620 million USD, and according to MIT data.

**10) Uruguay (3.2 million metric tons)**

Soy plantation occupies over 60 percent of Uruguay's arable farmland and annual soybean production has been on the rise in recent years. During the 2012-2013 growing season. The country produced 2.76 million tons of soybean and in the 2013-2014 season that production rose to 3.2 million according to the country's ministry of Agriculture. The soybean exports in 2013 earned the country

\$1.89 billion USD. According to the Manachustts institute of technology data increasing is production have been attributed to farmers adopting of certified soybean seeds better suited to grow with is the country's ecological envisions initially. Uruguayan farmers had planted seeds that have been bred for other regions according to the United states Department of Agriculture's (USDA) Foreign Agricultural Science (FAS) Almost 100 percent of the seeds used commercially today are also bred using modern biotechnology , producing genetically modified organisms (Gmos).

### **Impacts of Soy-**

As a soybean agriculture sweeps across South America and elsewhere. Fragile ecosystem such as rain forests and savannah are feeling the strain. As are iconic species like the Jaguar and giant anteater. In some case Small holder growing crops for subsistence are being displaced by the explanation of soybean plantations.

Conversion of high conservation value area (HCVA) and other critical habitats for soybean cultivation is unacceptable as it threatens biodiversity endangered species and the livelihood of local people.

### **The climate Connection:-**

The expansion of soybean plantation in to forests is also contributing to climating charge; Deforestation is responsible for about 15% of all the global greenhouse gas emission caused by people.

Conversion of forests to soybean plantations in the Amazon particularly threatens the climate. The Amazon forests contain 90-140 billion tone's of carbon- that 9.14 years of current global annual human induced carbon emissions.

Soil erosion and environmental impacts from the ever increasing use of pesticides are also a growing problem where soybean is grown.

Runoff soybean can carry substantial level of agrochemical Suspended soil and organize matter. This is a major source of freshwater and groundwater combination which can have serious impacts on the health of people and wildlife.

Lucrative soybean production can have negative social impacts in Brazil, Argentina, and Paraguay. The concentration of farmland in the lands of few has pushed small farmers and communities off the land and encouraged exploitation of workers.

### **Suggest for soybean production:-**

How do you get the best soybean yield? Research Illinois farmer Marion calmer has tested particles on his soybean crops to help increase yields and some of these are just basis for growing soybean. From now till and narrow rows soybean fertilizer and seeding rates there particles have WWF global -2016 helped calmer increase soybean yields.

Marion calmer has done independent on farm reach for nearly 30 years. With more than 300 research plots on his farm the Alpha I,II, corn and soybean farmer has tested and continuous to test practices to break through his soybean-yield barrier. Five have risen to the top you cannot improve on things you do it measure he says during the mid 1980. May soybean yields averaged in the mid to upper 40 bushels per acre “he says”. I have added about 20 bushels to the acre. The goal natural is to shoot for 100 bushels, if it’s economical.

1) Switch to no till. After realizing in the 1980 that conventional tillage was not going to meet his long term environmental goal calmer no tilled soybeans. Before that, soybean had been one of the most soil-erosive crops he had ever grown he says.

I started no tilling beans in to cornstalks no till require trying different thing to see what will work on your farm. If you keep a positive attitude you can make it work he say’s “No-till really helped may yields during 2017.

Apply dry fertilizer calmer sees a return on investment to spreading pack the follows university of Illinois guidelines for balancing his PH with lime application each year . Last season after not using pork for about decade he applied about \$50 worth of p and k per acre based on soil-test results. Soybean yields averaged 59 bushels per acre.

Surface application and stratification may be the problem, calmer says so he evaluates micronutrients and root- zone band application. The yield kick has to be better than 4 bushels per acre to make it work he says.

Calmers used to drill 200.000 soybean seeds in 15 inch rows. He first dripped that to 150.000 or four seeds per foot or row. For the last five years he has planted 75000 or two seeds per foot of row and is seeing more pods per plant. He always plants treated seed.

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