

Original Research Article

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## Examine the Changes in Area, Production, Productivity and Major Constraints under Soybean Seed Production in Kabirdham District of Chhattisgarh, India

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### ABSTRACT

Study was conducted in Kabirdham district of Chhattisgarh state. 49 soybean seed producers were selected randomly from two blocks of this district i.e. Kawardha and Lohara. Soybean seed producers were selected randomly and were considered to collect the required information on the cost of cultivation and other aspects for the present study. The secondary data was collected from the Chhattisgarh State Seed and Agriculture Development Nigam Limited Raipur for examine the changes in area, production, productivity of seed production of Soybean. Primary data was collected from the soybean seed producers through personal interview method with the help of well-prepared schedule for the production for kharif soybean 2016-17 for examine the major constraints under Soybean Seed Production. The objectives were achieved using exponential function, tabular, arithmetic and perception analysis. The response of farmers about seed production constraints namely Unavailability of labor in crop season, Time factor (Delay in payment), Natural calamities (Rainfall occur during the harvesting and threshing), Low adoption of recommended package and practices of the crop, Ignorance of severs infestation of insect-pest disease control, Unavailability of proper training and guidance, lack of literacy and technological problem in farm production (low productivity).

#### Keywords

Randomly, area, production, productivity, seed production & major constraints

#### Article Info

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### Introduction

Soybean (*Glycine max*, Linn.) is a leguminous and self-pollinated crop belongs to family Leguminaceae and sub-family Papilionoideae (fabaceae). Soybean is rightly termed as miracle crop as well as “GOLDEN BEAN” of the 21th Century because of its unique qualities. Though, Soybean is a legume crop, yet it is widely used as oilseed. Due to very

poor cook ability on account of inherent presence of trypsin inhibitor, it cannot be utilized as a pulse. It is now the second largest oilseed in India after groundnut. It grows in varied agro-climatic conditions.

Seed is the most important input in increasing productivity in agriculture. Inputs such as fertilizer, water etc. help to realize the potential imbibed in seed.

Viewed in the context of limited possibility of expansion of area for cultivation in most developing countries such as India the role of seed to increase agricultural production in the future becomes all the more crucial. It is believed that genetically good quality seed alone can increase production up to 20 per cent.

Recognizing the importance of a vibrant seed industry to augment agricultural production to meet the challenges posed by the burgeoning population the Government of India initiated various policy measures which helped the growth of the nascent industry. The study is being conducted with the following specific objectives: to examine the changes in area, production & productivity of seed production of soybean in the study area and to find out the major constraints in seed production of soybean in the study area.

### **Materials and Methods**

Chhattisgarh state consist 27 districts, out of these districts Kabirdham district was selected purposively for the study because its area and production is maximum for Soybean seed production. The Kabirdham district has four blocks, namely Kawardha, Lohara, Pandariya&Bodla.

Out of these two block namely Kawardha and Lohara were selected because these two blocks Kawardha and Lohara contribute highest area of soybean seed production in Kabirdham district.

Total 196 soybean seed producer farmers in Kawardha and Lohara block in which 119 farmers are from Kawardha block and 77 farmers are from Lohara block so 25% farmers were selected randomly for the present study. Thus total 49 farmers were selected out of these 30 farmers selected from Kawardha block and 19 farmers selected from

Lohara block. The study required primary as well as secondary data. Primary data was collected from selected soybean seed growers through personal interview method with the help of pre-tested questionnaires.

In order to compute the production and productivity of Soybean in the study area and secondary data was collected from Chhattisgarh State Seed and Agriculture Development Corporation Limited, Raipur district of Chhattisgarh. The collected data was analyzed by using average and percentage techniques for fulfillment of the objectives

### **Results and Discussion**

#### **Changes in area and production under seed production of soybean**

Table no. 3.1, 3.2, 3.3 and fig. 3.4 showed the comparative changes in area, production and productivity of soybean in Kabirdham district. In the year 2011, 2012, 2013 and 2014 the increase in area under soybean cultivation was 1074.70, 719.80, 1006.20 and 100 ha respectively compare to the base year (2010) during which cultivated area was 863.80 ha

The change in production showed increasing trend from the base year 2010 to 2013 and the production increased by 5691.45, 5704.97, 8398.51 qt./ha in the year 2011, 2012 and 2013 respectively. The productivity decreased by 305.01, 130.53 and 131.87 kg/ha in the year 2011, 2012 and 2013 respectively from the base year productivity.

In the year 2014, there was no production due to severe damage to the soybean crop by a fungal disease sudden death syndrome and therefore the productivity was zero. In the year 2015, the area, production and productivity decreased by 268.30 ha, 9248.55 qt. and 1066.59 kg per ha respectively from

the corresponding base year (2010) due to damage to soybean crop by heavy rainfall. The area, production and productivity of soybean in the year 2016 decreased from the base year(2010) due to less registered area under seed production and decreased by 599.00 ha, 4821.71 qt. and 621.62 kg per ha respectively from the corresponding base years(2010) area, production and productivity.

Table 3.6, 3.7, 3.8 and fig. no 3.2 shows the comparative changes in area, production and productivity of soybean in Chhattisgarh. In the year 2009, 2010, 2011, 2012 and 2013 the increase in area under soybean cultivation was 2075.15, 2243.35, 2827.61, 3012.86 and 3337.52 ha respectively compare to the base year (2008) during which cultivated area was 4726.55 ha.

The change in production showed increasing trend from the base year 2008 to 2013 and the production increased by 14296.11, 50192.07, 21428.67, 43157.66 and 15741.90 qt./ha in the year 2009, 2010, 2011, 2012 and 2013 respectively.

The productivity increased by 3.10, 501.66, 29.60 and 293.40 kg/ha in the year 2009, 2010, 2011 and 2012 respectively from the base year(2008) productivity.

The productivity decreased by 85.71, 632.48 and 626.07 kg/ha in the year 2013, 2014 and 2015 respectively from the base year (2008) productivity. In the year 2014, 2015 and 2016 the decrease in area under soybean cultivation was 470.49, 22436.06 and 3915.46 ha respectively compare to the base year (2008).

In the year 2014, 2015 and 2016 the decrease in production under soybean cultivation was 30112.31, 30875.24 and 21542.55 qt./ha respectively compare to the base year (2008). In the year 2013, 2014 and 2015 the decrease

in productivity under soybean cultivation was 85.71, 632.48 and 626.07 kg/ha respectively compare to the base year (2008) but in 2016 the productivity is higher compare to the base year which is 620.69 kg/ha more than the base year productivity.

### **Major constraints in soybean seed production**

The response of farmers about seed production constraints namely Unavailability of labour in crop season, Time factor (Delay in payment), Natural calamities (Rainfall occur during the harvesting and threshing), Low adoption of recommended package and practices of the crop, Ignorance of severe infestation of insect-pest disease control, Unavailability of proper training and guidance, lack of literacy and technological problem in farm production (low productivity) and other constraints which directly affected the soybean seed productivity are discussed in this section.

The Table 3.9 revealed that for overall 100 per cent seed producer quoted Time factor (Delay in payment) it was ranked I. Second one was Natural calamities (Rainfall occur during the harvesting and threshing ) found 93.87 per cent and ranked II, Unavailability of labor in crop season found 79.60 per cent and ranked III, The constraint Unavailability of proper training and guidance was found 73.47 per cent and ranked IV.

The technological problem in farm production (low productivity) was found 71.42 per cent and ranked V. Lack of literacy was found 69.38 and ranked VI.

Low adaptation of recommended package and practices of the crop was found 39.87 per cent and ranked VII. Ignorance of severe infestation of insect-pest disease control was found 65.30 per cent and ranked VIII.

**Table.1** Area, Production and Productivity of soybean in Kabirdham District

S.No.	Year Productivity	Total Area(ha)	Total Production (qt.)	(kg/ha)
1	2010	863.80	9326.95	1079.75
2	2011	1938.50	15018.40	774.74
3	2012	1583.60	15031.92	949.22
4	2013	1870.00	17725.46	947.88
5	2014	963.80	-	-
6	2015	595.50	78.40	13.16
7	2016	264.80	4505.24	1701.37

Source- C.G. State Seed and Agriculture Development Nigam Limited Raipur

**Table.2** Changes in Area of Soybean in Kabirdham District

S. No	Year	Total Area(ha)	Change in Area	% Change in Area
1	<b>2010 (Base Year)</b>	<b>863.80</b>	<b>863.80</b>	-
2	2011	1938.50	+1074.70	124.41
3	2012	1583.60	+719.80	83.33
4	2013	1870.00	+1006.20	116.48
5	2014	963.80	+100.00	11.57
6	2015	595.50	-268.30	31.06
7	2016	264.80	-599.00	69.34

**Table.3** Changes in Production of Soybean in Kabirdham District

S. No	Year	Total Production(qt.)	Changes in Production(qt.)	% Change in Production
1	<b>2010 (Base Year)</b>	<b>9326.95</b>	<b>9326.95</b>	-
2	2011	15018.40	+5691.45	61.02
3	2012	15031.92	+5704.97	61.16
4	2013	17725.46	+8398.51	90.04
5	2014	0	0	00
6	2015	78.40	-9248.55	99.15
7	2016	4505.24	-4821.71	51.70

**Table.4** Changes in Productivity of Soybean in Kabirdham District

S. No	Year	Productivity (kg/ha)	Changes in Productivity (kg/ha)	% Change in Productivity
<b>1</b>	<b>2010 (Base Year)</b>	<b>1079.75</b>	<b>1079.75</b>	-
<b>2</b>	2011	774.74	-305.01	28.24
<b>3</b>	2012	949.22	-130.53	12.08
<b>4</b>	2013	947.88	-131.87	12.21
<b>5</b>	2014	0	0	00
<b>6</b>	2015	13.16	-1066.59	98.78
<b>7</b>	2016	1701.37	621.62	57.58

**Table.5** Area, Production and Productivity of Soybean in Chhattisgarh

S. No.	Year	Total Area(ha)	Total Production(qt.)	Productivity (kg/ha)
<b>1</b>	2008	4726.55	32082.29	678.76
<b>2</b>	2009	6801.70	46378.40	681.86
<b>3</b>	2010	6969.90	82274.36	1180.42
<b>4</b>	2011	7554.16	53510.96	708.36
<b>5</b>	2012	7739.41	75239.95	972.16
<b>6</b>	2013	8064.07	47824.19	593.05
<b>7</b>	2014	4256.06	1969.98	46.28
<b>8</b>	2015	2290.49	1207.05	52.69
<b>9</b>	2016	811.09	10539.74	1299.45

Source- C.G. State Seed and Agriculture Development Nigam Limited Raipur

**Table.6** Changes in Area of Soybean in Chhattisgarh

S. No.	Year	Total Area(ha)	Changes in Area(ha)	% in Change Area
<b>1</b>	<b>2008 (Base year)</b>	<b>4726.55</b>	<b>4726.55</b>	-
<b>2</b>	2009	6801.70	+2075.15	43.90
<b>3</b>	2010	6969.90	+2243.35	47.46
<b>4</b>	2011	7554.16	+2827.61	59.82
<b>5</b>	2012	7739.41	+3012.86	63.74
<b>6</b>	2013	8064.07	+3337.52	70.61
<b>7</b>	2014	4256.06	-470.49	9.95
<b>8</b>	2015	2290.49	-2436.06	51.53
<b>9</b>	2016	811.09	-3915.46	82.84

**Table.7** Changes in Production of Soybean in Chhattisgarh

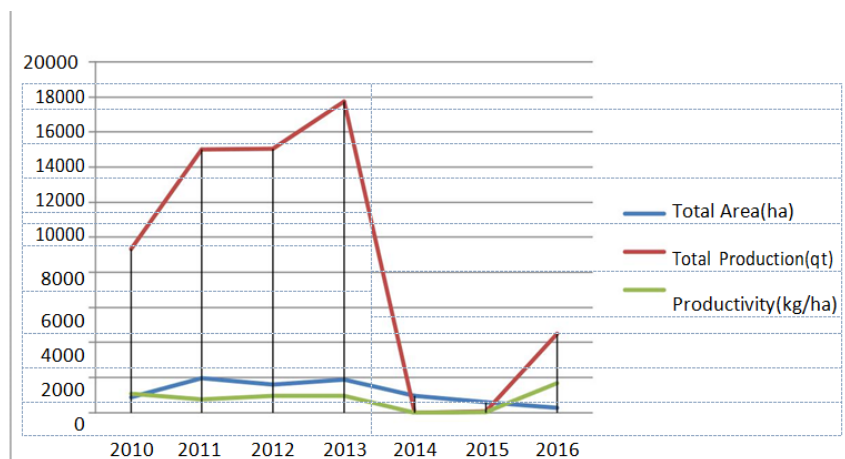
S. No.	Year	Total Production(qt.)	Changes in Production(qt.)	% Change in Production
1	<b>2008</b> (Base year)	32082.29	<b>32082.29</b>	-
2	2009	46378.40	+14296.11	44.56
3	2010	82274.36	+50192.07	157.44
4	2011	53510.96	+21428.67	66.79
5	2012	75239.95	+43157.66	134.52
6	2013	47824.19	+15741.90	49.06
7	2014	1969.98	-30112.31	93.85
8	2015	1207.05	-30875.24	96.24
9	2016	10539.74	-21542.55	67.15

**Table.8** Changes in Productivity of Soybean in Chhattisgarh

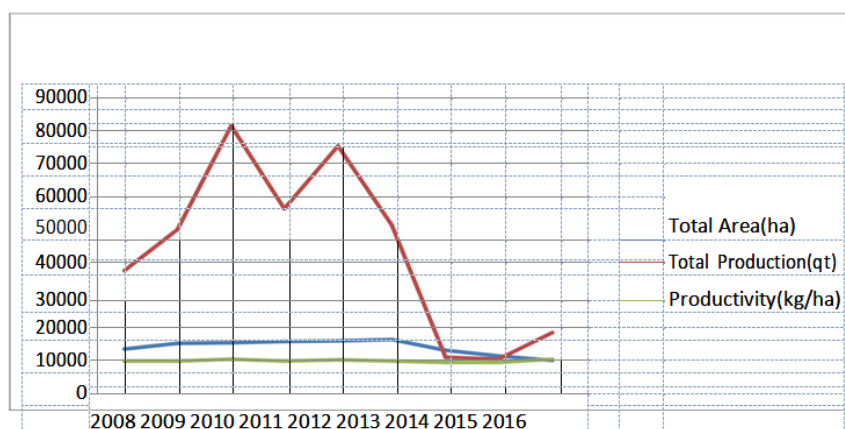
S. No.	Year	Productivity (kg/ha)	Changes in Productivity (kg/ha)	% Change in Productivity
1	<b>2008</b> (Base year)	<b>678.76</b>	<b>678.76</b>	-
2	2009	681.86	+3.10	0.46
3	2010	1180.42	+501.66	73.91
4	2011	708.36	+29.60	4.36
5	2012	972.16	+293.40	43.22
6	2013	593.05	-85.71	12.62
7	2014	46.28	-632.48	93.18
8	2015	52.69	-626.07	92.24
9	2016	1299.45	+620.69	91.35

**Table.9** Major Constraints of soybean seed production

S. No.	Constraints relating	Respondents (n=49)		Rank
		Number	Percentage	
1.	Unavailability of labour in crop Season	39	79.60	III
2.	Time factor (Delay in payment)	49	100	I
3.	Natural calamities (rainfall occur during the harvesting and threshing )	46	93.87	II
4.	Ignorance of severe infestation of insect-pest disease control	32	65.30	VIII
5.	Unavailability of proper training and guidance	36	73.47	IV
6.	Lack of literacy	34	69.38	VI
7.	Technological problem in farm production( Low productivity)	35	71.42	V
8.	Low adaptation of recommended package and practices of the crop	33	67.34	VII



**Fig.1** Change in Area, Production and Productivity of Soybean in Kabirdham District



**Fig.2** Change in Area, Production and Productivity of soybean in Chhattisgarh state

In the year 2011, 2012, 2013 and 2014 there was increase in area under soybean cultivation was 1074.70, 719.80, 1006.20 and 100 ha respectively compare to the base year (2010) during which cultivated area was 863.80 ha. The change in production showed increasing trend from the base year 2010 to 2013 and the production increased by 5691.45, 5704.97, 8398.51 qt./ha in the year 2011, 2012 and 2013 respectively.

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The response of farmers about seed production constraints namely Unavailability of labor in crop season, Time factor (Delay in

payment), Natural calamities (Rainfall occurring during the harvesting and threshing), Low adoption of recommended package and practices of the crop, Ignorance of severe infestation of insect-pest disease control, Unavailability of proper knowledge and guidance, lack of literacy and technological problem in farm production (low productivity).

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