RESEARCH ARTICLE

ESTIMATE THE DEMAND FOR HYBRID COTTON SEEDS IN NORTH KARNATAKA

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Received-09.07.2018, Revised-26.07.2018

Abstract: Seed is a very vital input and dynamic instrument for increasing agricultural production. It has been one of the miraculous inputs responsible for green revolution in India and elsewhere. A multistage random sampling was adopted as appropriate sampling procedure for the study. As the research study focuses on the aspect such as estimating demand of hybrid cotton seeds in North Karnataka the secondary data required for the study was collected from the publications sources of the Department of Agriculture, Districts Statistical Office (DSO), Directorate of Economics and Statistics (DES), Ministry of Agriculture, Ministry of Communication & IT, Government of India and other related departments. To estimate the demand for hybrid cotton seeds ARIMA technique was used for the study. Projected demand for hybrid cotton seeds in Dharwad and Haveri district were expected to be decrease from 66664.23 kgs in 2014-15 to 53129.65kgs in 2019-20 in Dharwad district, and in Haveri district is expected to be decrease from 71876.5 kgs in 2014-15 to 64905.20 kgs in 2019-20. This is due to decrease in the cotton area and lack of assured and remunerable price and it's a result that area switching over to other commercial crops.

Keywords: ARIMA, Demand, Hybrid cotton, Seed

INTRODUCTION

Seed is a very vital input and dynamic instrument for increasing agricultural production. It has been one of the miraculous inputs responsible for green revolution in India and elsewhere. The green revolution has brought prosperity, stability and confidence not only in agriculture, but also in the economic well being of the country.

The process of modernizing Indian agriculture primarily involves the intensive use of non-conventional inputs such as quality seeds, chemical fertilizers, pesticides, weedicides, irrigation, farm machinery and a network of research and extension infrastructure. The quality seed is a trigger point which sets in motion the process of technological change. The returns to investment depend significantly on the quality of crops. Impact of quality seeds in enhancing the yield potential is highly felt now-adays. Superior planting material and high quality seed is the single most important factor enabling a country to make its agriculture more productive and cost competitive especially in the scenario of world agricultural trade under the WTO regime. In the development of agriculture, seed has been important since crops were first domesticated. In the traditional agriculture, the cultivators use to retain part of the produce for seed purposes. However, with the introduction of new technology in Indian agriculture which was based on the use of high yielding varieties and hybrids of crop plants responsive to high levels of chemicals of fertilizers and irrigation. With the development of plant breeding in the early twentieth century, improved crop varieties were evolved and their seed production was taken up in the organized sector. Seed firms, whether in the private or public sector, outsource the production of seeds through contract growers. These growers are supplied with the foundation seed that is used to produce commercial seed. The seed industry is one of the earliest examples of contract farming in India.

Cotton seed Industry in Karnataka

The cotton seed industry has emerged as an important component in the seed market basically due to its ability for development of hybrids and diversity of production. To satisfy the continuous demand for cotton seeds by the farmers, several seed companies in the corporate sector are supplying seeds in the cotton growing region. Some of the important companies, which supply seeds Kaveri seeds Pvt. Ltd., Krishidhan Seeds Pvt. Ltd, Machyo Seeds Pvt. Ltd., Shri Ram Bioseed Genetics India Ltd., G. K. Seeds, Monsanto seeds Pvt. Ltd, Ajeet seeds Pvt. Ltd, Nuziveedu seeds Pvt. Ltd, Rasi seeds Pvt. Ltd, Prabhat seeds Pvt. Ltd, Ankur seeds Pvt. Ltd, Vikram seeds Pvt. Ltd, Vibha seeds Pvt. Ltd, etc. These seed companies supply seeds first to the distributors, who in turn employ the dealers through whom seeds reach the ultimate users i.e., the farmers. These dealers operate at the taluka level and they come in direct contact with the farmers. The

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marketing of seeds involves demand assessment, structure, shares, farmers brand acceptance, logistics, etc.

Cotton is of considerable importance in the light of changing agricultural scenario. With increased role of cotton in the Karnataka is state economy and with the liberalization policy of the Government of India, it has opened up for most of the multinational and Indian companies to enter into this mega demand based cotton crop to make huge profit through hybrid seed production. Since then the seed industry, the pesticide and other supporting sectors have received a boost in terms of their trade with the rural market. The marketing of seed has undergone a tremendous transformation in terms of seed logistics and farmer acceptance of varieties especially in the last decade. As is well known, the technological breakthrough in development of Double Bt cotton also has created a revolution in development of pest resistance hybrids etc. have all contributed for the overall improvement in the yields of cotton.

In the present context of globalization, liberalization and privatization, it has becomes more important that one should focus more on the marketing and its services so that it will ultimately bring the results of the technological changes in the present day. Since in the recent years advanced technologically developed hybrid cotton seeds in the area and production is increasing trend in the major districts of the state. The farmers are getting highest return from the increased productivity as compared to the old hybrid cotton seeds. A number of hybrid cotton seed varieties are introduced by the Mahyco Ltd, Kaveri Ltd, and Ankoor Ltd etc., which are giving maximum yield to the farmers by producing good quality cotton.

METHODOLOGY

A multistage random sampling technique was adopted as appropriate sampling procedure for the study. The data on area under cotton in Karnataka was collected, which comprising of two northern districts of Karnataka namely Dharwad and Haveri these two districts were occupied highest area under cotton that contributed about 29 per cent of total area under cotton during the study period. Hence it was proposed to select these two districts for the study so as to investigate into research problem.

Secondary data: As the research study focuses on the aspect such as estimating demand of hybrid cotton seeds in North Karnataka the secondary data required for the study was collected from the publications sources of the Department of Agriculture, Districts Statistical Office (DSO), Directorate of Economics and Statistics (DES), Ministry of Agriculture, Ministry of Communication & IT, Government of India and other related departments. The districts were ranked in the order of the highest area to the total area under cotton in the state.

ANALYTICAL TECHNIQUE EMPLOYED

Auto Regressive Integrated Moving Average (ARIMA) model

For demand forecasting we used different models like Compound growth rate, Moving averages, Smoothing, Trend models by using above models we didn't get better results. So, ARIMA model was used for demand forecasting by Fitting ARIMA model the better results were obtained so we used ARIMA model.

RESULTS AND DISCUSSION

Projected demand for hybrid cotton seeds in North Karnataka

It is observed from the Table 1 that over the years from 1998-99 the actual demand of cotton seeds was 97734.37 kgs, and also it could be seen from the Table that from 1999 to 2014 the demand of cotton seeds was 69609.90kgs, the demand of cotton seeds was decreasing in case of Dharwad district, and from 2014-15 the projected demand for hybrid cotton seeds was 66664.23 kgs and it was forecasted till 2019-20. In 2019-20 the projected was seen to be 53129.65kgs, and Mean Absolute Percentage Error was observed to be 11.31 which tell us that the forecasted demand for hybrid cotton seeds is decreasing in Dharwad district.

It is observed from the Table 2 that in year 1998-99 the actual demand for cotton seeds was 89304.75 kgs and from 1998 to 2014 the demand of hybrid cotton seeds was 71876.50 kgs which shows decreasing in the actual demand for hybrid cotton seeds. From 2014-15 the forecasted demand was seen to be 70714.62 kgs and in 2019-20 the forecasted demand was seen to be 64905.20 kgs, and Mean Absolute Percentage Error was observed to be 16.57 which tells us that the forecasted demand for hybrid cotton seeds is decreasing in Haveri district.

This is due to in the area under hybrid cotton seeds in upcoming years will be decreased in both Dharwad and Haveri district. The reason behind this was lack of assured and remunerable price (price of cotton decreasing over the years) and its a result that area switching over to other crops. The similar findings were observed in case of Thimmanna (2007).

Table 1. Projected demand for hybrid cotton seeds in Dharwad district **(in kg's)**

Sl.No	Year	Actual	Forecasted
1	1999	97734.38	----------
2	2000	107257.50	95027.46
3	2001	104510.25	98435.56

4	2002	118607.63	97753.54
5	2003	102776.63	100260.15
6	2004	88386.38	98056.53
7	2005	97291.13	93737.99
8	2006	86618.25	91538.67
9	2007	83273.63	88216.70
10	2008	81688.50	84960.55
11	2009	80123.63	81926.43
12	2010	93893.63	79055.62
13	2011	99382.50	77585.21
14	2012	77590.13	76555.01
15	2013	46023.75	73922.03
16	2014	69609.90	69355.23
17	2015		66664.23
18	2016		63957.31
19	2017		61250.40
20	2018		58543.48
21	2019		55836.56
22	2020		53129.65

Mean Absolute Percentage Error – 11.31

Table 2. Projected demand for hybrid cotton seeds in Haveri district **(in kg's)**

Sl.No	Year	Actual	Forecasted
1	1999	89304.75	----------
2	2000	80942.63	88142.87
3	2001	75384.00	79780.74
4	2002	90928.13	74222.12
5	2003	67033.13	89766.24
6	2004	53233.88	65871.24
7	2005	71325.00	52071.99
8	2006	67242.38	70163.12
9	2007	86016.38	66080.49
10	2008	88762.50	84854.49
11	2009	103425.75	87600.62
12	2010	122884.88	102263.87
13	2011	117821.25	121722.99
14	2012	119408.63	116659.37
15	2013	73866.38	118246.74
16	2014	71876.50	72704.49
17	2015		70714.62
18	2016		69552.73
19	2017		68390.85
20	2018		67228.97
21	2019		66067.08
22	2020		64905.20

Mean Absolute Percentage Error- 16.57

CONCLUSION

Seed is a very vital input and dynamic instrument for increasing agricultural production. It has been one of the miraculous inputs responsible for green revolution in India and elsewhere. The green revolution has brought prosperity, stability and confidence not only in agriculture, but also in the economic well being of the country. Projected demand for hybrid cotton seeds in Dharwad and Haveri district were expected to be decrease from 66664.23 kgs in 2014-15 to 53129.65kgs in 2019-20 in Dharwad district, and in Haveri district is expected to be decrease from 71876.5 kgs in 2014-15 to 64905.20 kgs in 2019-20. This is due to decrease in the cotton area and lack of assured and remunerable price (price of cotton decreasing over the years) and it's a result that area switching over to other commercial crops.

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