

## Scientometrics of Seed Technology Research in India Seen Through Web of Science Database during 1989-2017

**N.SURESH**

Research Scholar,

Department of LIS, Alagappa University, Karaikudi - 630 003

**Dr. S. THANUSKODI**

Professor and Head

Dept. of LIS, Alagappa University, Karaikudi - 630 003

### ABSTRACT

This paper analyzes India's research in Seed technology during the period 1989–2017 based on WEB OF SCIENCE records, total of 668 Research Publication were published by the researchers to various domains; In the subject category Agriculture topped with 268 documents, 82% publications were published in Journals as document type and the most preferred journals were Indian Journal of Agricultural Sciences (50). Seed Technology research output has grown by 475% between 2006-2009 which shows that there is an increasing trend of research activities in Seed Technology research. India was 3rd among the top ten most productive countries of the world in Seed Technology research during 1989-2017.

**Keywords:** Seed technology Research, Scientometrics, India

### 1. INTRODUCTION:

Indian is the agriculture country, where more than 50% of population is doing on agriculture and agriculture sector accounts for 18 per cent of India's gross domestic product (GDP).it is said that agriculture is a backbone of our economy. Quantity and Quality of Agricultural production based upon a number of factors, it includes fertilizers, irrigation and plant protection measures and suitable agricultural practices. If good quality seed is not used, the full benefit of such inputs and agricultural practices cannot be realized. The cost of seed represents a mere fraction (2-3%) of the total cost of production, but the

quality of seed plays a decisive role in influencing the growers profitability. Presently, Seed technology research is being treated as one of the India's essential research compared to all other subjects.

Scientometric analysis of literature provides clear picture of research trends in the field concerned. In this paper attempts to analyze quantitatively research output in seed technology from Indian researcher's in terms of research publication in Web of Science (WOS) database during 1989 to 2017.

## 2. REVIEW OF LITERATURE

Various Scientometrics studies on different branches of learning analyzing India's research output have been carried out in the past Tripathi and Garg (2016) Research output in Cereal Crop Science reflected in SCOPUS database during 1965-2010. Rajendran (2014) his paper analyzes India's contribution to world tribology research during the period 2001–2012 based on SCOPUS records. Kaur and Gupta (2010) studied 1380 Indian dental science papers published during 1999-2008 SCOPUS. Thanuskodi (2009) examined the present study has been undertaken to assess the research performance of Indian scientists in ecology. Venkatesan (2014) his study focus on Growth of Publication, Author Pattern, and Year wise citations using SCOPUS database analysing nuclear Power Generation.

## 3. METHODOLOGY

The data for the study was cull out from WEB OF SCIENCE database for the period 1989 to 2017. The Key word "seed technology" and refine search with country 'India' was using to downloading the records and MS EXCEL and Publish or Perish software used analysis the data.

## 4. OBJECTIVES OF THE STUDY

To discuss the Indian Seed technology research output during the 1989-2017 period using the WEB OF SCIENCE database to focus on the following aspects:

- To measure the Indian publication output during 1989 to 2017
- To measure the Source wise publications
- To measure the Document wise publications
- To measure the Subject wise publications

## 5. RESULTS AND DISCUSSIONS

### 5.1. YEAR-WISE DISTRIBUTION OF PUBLICATIONS

A total of 668 publications were published during 1989-2017. The average number of publications per year was 23 . a continuous growth of publications was observed during 2005-2017. The highest publications 84 were in 20016. It was observed that there was a steady growth of publications during 2005-2017..

These publications have received 9287 citations during 1989-2017. The highest number of citations 1208 were in 2009. The average citations per year was 357.1. The average citations per publication was 13.902. There is a declining trend of citations in food preservation research in the world during 2014-2017. It is well known that the 2006-2010 publications tend to receive more citations than recent publications as the publications require more time to be noticed by the researchers and to find the context to cite them.

Table: 1. *Annual Output and Citation Impact of Indian Seed Technology*

Year	TP	TC	CPP
1989	3	5	1.7
1991	3	149	49.7
1992	4	9	2.25
1994	6	78	13
1995	3	20	6.6
1997	4	39	9.7
1998	6	140	23.3
1999	10	453	45.3
2000	12	228	19
2001	8	199	24.8
2002	5	230	46
2003	9	431	47.8
2004	9	258	28.6
2005	14	267	19
2006	11	397	36
2007	27	987	36.5
2008	33	944	28.6

2009	30	1208	40.2
2010	39	789	20.7
2011	45	449	9.9
2012	34	470	13.
2013	54	533	9.8
2014	51	484	9.4
2015	84	380	4.5
2016	84	212	2.52
2017	80	49	0.6

*TP = Total Papers, TC = Total Citations, CPP = Citations per Paper = TC / TP*

## 5.2. AUTHOR WISE CONTRIBUTIONS

Table 2 shows that total 314 authors published their contributions in Seed Technology and Table 2 Shows top 15 authors who have published 8 or more articles kumar a holding first position with 21 articles

Table: 2. *Prolific Authors*

Authors	Articles	%of 668
Kumar a	21	3.144
Kumar s	14	2.096
Sharma s	13	1.946
Singh b	13	1.946
Singh s	12	1.796
Ladha jk	10	1.497
Varshney rk	10	1.497
Jat ml	9	1.347
Kumar v	9	1.347
Singh r	9	1.347
Kumar d	8	1.198
Kumar p	8	1.198
Kumar r	8	1.198

Singh m	8	1.198
---------	---	-------

### 5.3 AUTHORSHIP PATTERN ANALYSIS

During the study period 1989 to 2017, the authorship pattern analysis revealed that Three authors contributions dominant in the field, the 358 documents with 53%. Two authors with 204 documents with (30%) followed by Single author 65 documents with (9%).Its indicates that share of Mega authors is lowest followed by single author, Further analysis that Three authors was highest in total contribution with More than half of total and Two authors contribution significantly good. Authorship pattern shows Seed technology multidisciplinary which involves many researchers from different disciplines.

Table: 3. *Authorship Pattern*

Authorship Pattern	Articles	% 668
Single Author	65	9.730539
Two Authors	204	30.53892
Three Authors	358	53.59281
Mega Authors (>4)	41	6.137725
Total	668	100

### 5.4. DOCUMENT WISE DISTRIBUTION

Table 4 presents the different forms of Indian Seed Technology Research . Out of 668 records 550 were published in the form of Journal articles followed by review (110). Proceedings paper 21,Book chapter 9 and letter constituted 3 respectively

Table: 4. *Forms of Publications*

<b>Document Types</b>	<b>Records</b>	<b>% of 668</b>
Article	550	82.335
Review	110	16.467
Proceedings paper	21	3.144
Book chapter	9	1.347
Letter	3	0.449

#### 5.4.SUBJECT WISE PUBLICATION

Seed technology is the multidisciplinary subject which deals with areas such as agriculture ,Plant science, Biotechnology etc. analysis of data indicates that higher number (40%) published in Agriculture followed by Plant science (14%).Bio Technology and science technology each have 10% contribution. Thus ,these four sub-disciplines together publisher 74% of total output, Reset 26% Scattered to 37 subjects.

Table: 4. *Subject wise Publications*

<b>Subject</b>	<b>Articles</b>	<b>%</b>
Agriculture	268	40.12
Plant sciences	94	14.072
Biotechnology applied microbiology	70	10.479
Science technology other topics	70	10.479
Engineering	58	8.683
Food science technology	49	7.335
Energy fuels	40	5.988
Chemistry	32	4.79
Environmental sciences ecology	31	4.641

Business economics	30	4.491
Biochemistry molecular biology	19	2.844
Genetics heredity	15	2.246
Materials science	12	1.796
Nutrition dietetics	12	1.796

## 5.6. SOURCE WISE DISTRIBUTION

The ten productive journals published at least 8 papers contributed by Indian authors are listed in total of 91 journals together produced 457 papers in Indian Seed Technology .It is evident from the table to identify the Indian Journal of Agricultural Sciences ranked first in order published 50 articles. Current Science occupied second in order published 27 articles during 1987-2017. Indian Journal of Economics and Development ranked third in order published 17 articles followed by Field Crops 15 articles the remaining journals ranked to their published articles.

Table: 6. *Top ten Journals*

Source	No. Publication	%
INDIAN JOURNAL OF AGRICULTURAL SCIENCES	50	7.485
CURRENT SCIENCE	27	4.042
INDIAN JOURNAL OF ECONOMICS AND DEVELOPMENT	17	2.545
FIELD CROPS RESEARCH	15	2.246
AMA AGRICULTURAL MECHANIZATION IN ASIA AFRICA AND LATIN AMERICA	13	1.946
LEGUME RESEARCH	13	1.946
JOURNAL OF FOOD SCIENCE AND TECHNOLOGY MYSORE	10	1.497
INDIAN JOURNAL OF AGRONOMY	9	1.347
INDUSTRIAL CROPS AND PRODUCTS	9	1.347
EXPERIMENTAL AGRICULTURE	8	1.198

## 6. CONCLUSION

Indian literature in Seed Technology has grown by 475% between 2006-2009 which shows that there is an increasing trend of research activities in Seed Technology research. India was 3rd among the top ten most productive countries of the world in Seed Technology research during 1989-2017. Most preferred form of writing research was Journal Article and Three authors contributions dominant in the field. Agriculture is the major subject of Seed Technology research.

The present study concludes that the Indian contribution to seed Technology research has increased greatly.

## REFERENCES

- 1.Kaur, H., & Gupta, B. M. (2010). Mapping of dental science research in India: a scientometric analysis of India's research output, 1999–2008. *Scientometrics*, 85(1), 361–376.
- 2.Rajendran.P (2014) Publication Trends and Citation Impact of Tribology Research in India: A Scientometric Study *Journal of Information Science Theory and Practice* 22-34, 2014
- 3..Tripathi ,HK and Garg ,KC (2016) Scientometrics of cereal crop science research in india seen through SCOPUS database during 1965-2010 *Annals of Library and Information Studies* Vol.63 ,September 2016, pp.222-231.
- 4.Thanuskodi S.(2009) Bibliometric Analysis of the Indian Journal of Chemistry. *Library Philosophy and Practice* (e-journal), 2009.  
<http://digitalcommons.unl.edu/libphilprac/278> (accessed on 20/3/2018)
- 5.Venkatesan , M N (2014) Nuclear Power Generation Research Seen Through Scopus: A Scientometric Analysis *International Journal of Digital Library Services* Vol.4 Oct-Dec 2014 Issue 4