

Web of Science-based analysis for Horticulture research output in India

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ABSTRACT

Horticultural produce is very economical and nutrient-rich food available for society. Data on horticulture research output by Indian scientists was retrieved from the Web of Science database for the period 2000 to 2019 and analyzed. The findings of the study revealed that 441 records were published in the horticultural field by the Indian scientists. The paper briefly discusses research out in different categories such as year wise output, source wise, topmost ranking for journals, author, institution, and keyword. Totally 267 research articles are a significant share than other research documents. Totally 202 journals were published 441 records by the contribution of 1192 authors. The total number of keywords used in the study research area was 1717. The highest number of publications made by Indian researchers was 46 in the year 2018. Among the journals, the Indian Journal of Agricultural sciences retained top place by publishing 62 research papers.

Keywords: Web of Science, research output, Horticulture

Introduction:

Horticulture includes fruits, vegetables, tubers, mushrooms, spices, flowers, medicinal and aromatic plants, and plantation crops. The different horticultural produce can supplement as food and nutrition to the requirements of society. Horticultural research works are focused on different aspects that start from cultivation to processing. Researchers are carried out by different researchers from national to global levels. However, the impact of research works should be evaluated for further improvement. Presently, several funding agencies are screening/evaluating the research proposal based on scientist and institution research background. The research output and its impact by the scientist and institution are also contributing a significant role in project approval by funding agencies. The present study is focused on horticulture research output by the

Indian researchers from different institutions and research groups, and their research impact was analyzed based on the data collected from Web of Science, and results are presented.

Web of Science:

Web of Science is a Clarivate Analytics product and online database. This database is one of the abstracting and citations of information. Generally, the number of citations, h index, and Total Global Citations Scores (TGCS) and Total Local Citations Scores (TLCS) are indicators for evaluating research output. These parameters obtained through hiscite software. It covers in various subject categories and provides information based on more authenticated documents published by the researchers. In other words, the Web of Science provides peer-reviewed, impact factor journals, books, conferences proceedings, etc.

Review of Related Literature

Sankar, M (2020) analyzed the research output of plant science in Tamil Nadu Agricultural University from 2000 to 2020 using Web of Sciences. He reported that the highest number of publications output 49 was in the year 2015 for the TNAU scientist's research output was in the form of research papers in (83.01%). The topmost journal preferred to publish was Plant archives, and it accounts for 30 papers. The most prolific author was Samiyappan R, and he published 45 articles in different journals. For institutional collaboration with Kansas State University for 28 articles in the first rank. The rice was the highest frequency keyword for the plant science category (97 times).

OBJECTIVES OF THE STUDY

- To identify the year-wise research output of horticulture scientists of India.
- To identify the source wise distribution in India in the horticulture research output.
- To identify the frequency of topmost journal distribution in horticulture research output.
- To identify the frequency top most author wise distribution.
- To identify the frequency of institution wise in India horticulture research out.
- To identify the topmost keyword for the horticulture research area.

METHODOLOGY

Web of Science is a scientific and indexing service available online, which is maintained by Thomson Reuters. In order to fulfill the objectives of the present study, the data was collected

from this online citation indexing database and analyzed. In this study, the Web of Science was used for data collected online from 2000 to 2019. The search string was the "horticulture" topic in the Web of Science was used and retrieved in April month. Further, the other subjects were excluded from the collected data and limited to horticulture subject records. Finally, all the downloaded data were analyzed through histcite software.

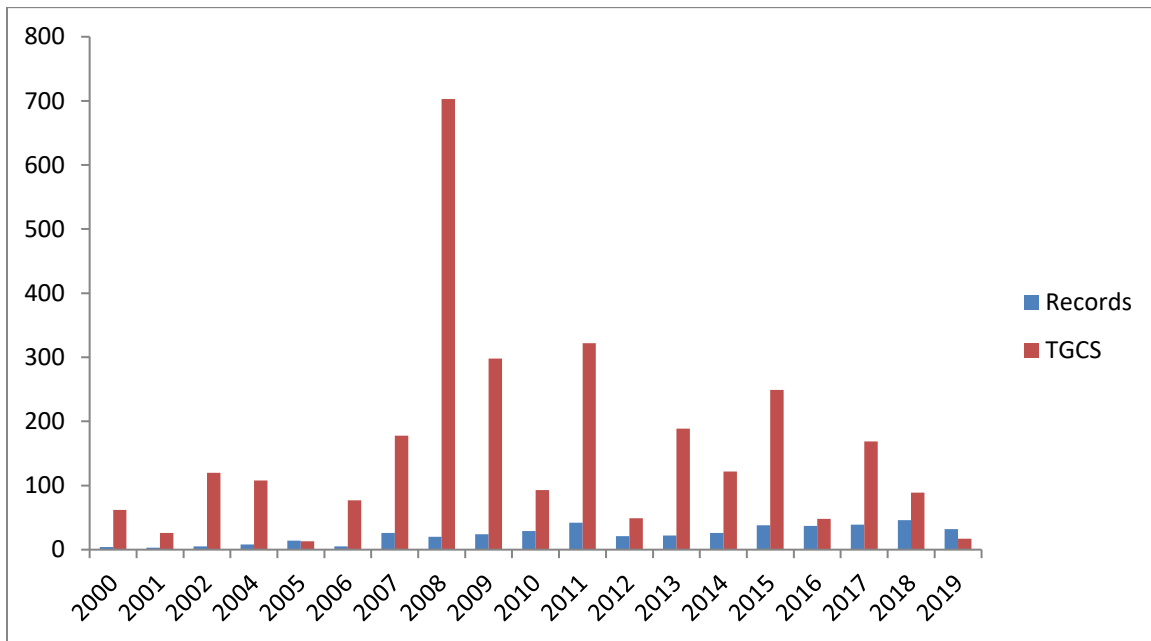


Fig.1 shows year wise research output, their percentage, and total citation scores

Fig.1 shows year wise research output, their percentage, and total citation scores at the global level for the horticulture field. For the study period, a total of 441 research documents were published in horticulture research by various scientists from different academic and research institutes in India. The average number of publications published per year by the Indian scientists was calculated as 23.21. The highest and lowest number of publications was 46, and 3 observed for the year 2018 and 2001, respectively. It is interesting to note that more than 20 publication records found in the horticulture field as a yearly research output in India for the period starting from 2007 to 2019. The Global Citation Scores (TGCS) for the study period was 2870. The highest TGCS (703) observed for 20 records published in the year 2008. Notably, the average number of TGCS per record was found to be highest for the papers published in 2008 and 2002.

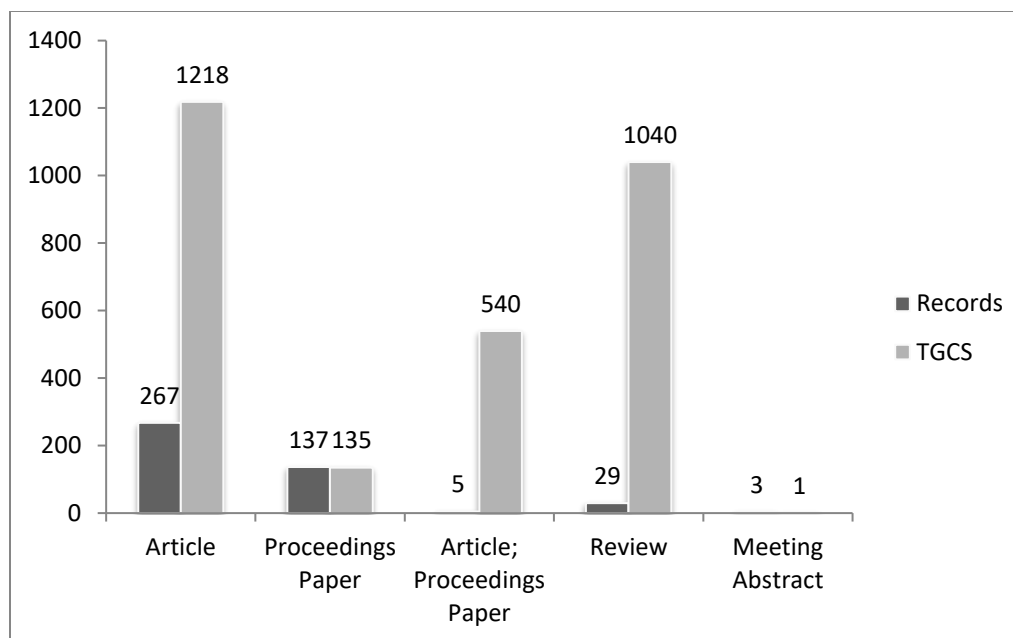


Fig. 2. Research documents published in horticulture by Indian authors (2000 to 2019).

The research documents published in the horticulture field by Indian authors in the study period from 2000 to 2019 are shown in Fig. 2. Horticulture research works were published by scientists in different kinds of research documents such as articles, proceedings, and different research meetings. It is evidenced that significant contribution was by research articles published in different journals (60.54%) and followed by proceedings paper (31.07%), review articles (6.58%), proceedings articles (1.13%), and meeting abstract (0.68%).

Table. 1. Top 25 journals preferred by Indian researchers to publish horticulture research.

Sl.No	Name of the journal	Records	TGCS
1	INDIAN JOURNAL OF AGRICULTURAL SCIENCES	62	49
2	INDIAN JOURNAL OF HORTICULTURE	27	13
3	II INTERNATIONAL SYMPOSIUM ON POMEGRANATE AND MINOR - INCLUDING MEDITERRANEAN - FRUITS: ISPMMF2009	17	9
4	PLANT ARCHIVES	16	8
5	CURRENT SCIENCE	13	60
6	II INTERNATIONAL SYMPOSIUM ON PAPAYA	10	0

7	RESEARCH ON CROPS	10	1
8	LEGUME RESEARCH	8	6
9	I INTERNATIONAL SYMPOSIUM ON CASHEW NUT	6	0
10	INTL JOURNAL OF AGRICULTURAL & STATISTICAL SCIENCES	6	4
11	PROCEEDINGS OF THE 1ST INTERNATIONAL GUAVA SYMPOSIUM	5	13
12	PROC. OF THE VIITH INTERNATIONAL SYMPOSIUM ON TEMPERATE ZONE FRUITS IN THE TROPICS & SUBTROPICS, PT 2	5	6
13	RANGE MANAGEMENT AND AGROFORESTRY	5	14
14	AMA-AGRICULTURAL MECHANIZATION IN ASIA AFRICA AND LATIN AMERICA	4	2
15	GENETIC RESOURCES AND CROP EVOLUTION	4	12
16	GLOBAL CONFERENCE ON AUGMENTING PRODUCTION AND UTILIZATION OF MANGO: BIOTIC AND ABIOTIC STRESSES	4	1
17	IVTH INTERNATIONAL SYMPOSIUM ON HORTICULTURAL EDUCATION, EXTENSION AND TRAINING - PROCEEDINGS	4	0
18	SCIENTIA HORTICULTURAE	4	112
19	AGROFORESTRY SYSTEMS	3	11
20	COMPUTERS AND ELECTRONICS IN AGRICULTURE	3	203
21	HORTSCIENCE	3	1
22	INDIAN JOURNAL OF ANIMAL SCIENCES	3	6
23	IV INTERNATIONAL SYMPOSIUM ON TROPICAL AND SUBTROPICAL FRUITS	3	0
24	JOURNAL OF PLANT NUTRITION	3	26
25	MAUSAM	3	7

The details of the top 25 journals preferred by Indian researchers to publish their horticulture research works during the study period are presented in table 1. The analyzed results show that the top 2 journals are Indian Journal of Agricultural Sciences (62 nos.) and Indian Journal of Horticulture (27 nos.). These two journals published from India and the NAAS rating for the year 2020 of these journals are more than 6.00. The papers published in the symposium on fruits such as pomegranate and papaya were within the top ten ranks. The records that appeared in the plant archives journal were 16.

Table. 2. Top 25 ranking for the author based their horticulture research output

Sl.No	Author	Records	TGCS
1	Singh DB	15	9
2	Singh B	14	196
3	Kumar S	13	16
4	Singh A	13	38
5	Singh S	10	47
6	Kumar R	9	13
7	Goswami A	7	2
8	Gupta YC	7	1
9	Kumar A	7	8
10	Roshan RK	7	0
11	Sharma V	7	26
12	Ahmed N	6	12
13	Bhardwaj DR	6	20
14	Kumar P	6	18
15	Kumar V	6	15
16	Mitra SK	6	4
17	Pebam N	6	0
18	Singh AK	6	2
19	Yadav M	6	3
20	Gowda VN	5	2
21	Kushwah SS	5	5
22	Nandre DR	5	1
23	Naruka IS	5	4
24	Pala NA	5	13
25	Reddy PVK	5	1

Table 2 present the author wise frequency of horticulture research output published in the study period. According to several research papers published during the reporting period, Singh DB ranking first place with 15 articles, second and third places backed by Singh B (14 articles) and Kumar S, and Singh A (13 articles), respectively. Based on TGCS, Singh B ranked first place with 196 citations. The second and third places retained by Singh S with 47 citations and Singh A (38 citations).

Table.3. Frequency of Institution wise in horticulture research output (Top 25)

Sl.No	Name of the institute	Records	TGCS
1	Dr. Yashwant Singh Parmar Univ Hort & Forestry	19	24
2	Univ Agr Sci	18	34
3	Punjab Agr Univ	13	23
4	Indian Agr Res Inst	12	41
5	Deemed Univ	10	6
6	Coll Hort	8	5
7	Banaras Hindu Univ	7	586
8	Bidhan Chandra Krishi Viswavidyalaya	7	5
9	Indian Inst Technol	7	161
10	Maharana Pratap Univ Agr & Technol	7	102
11	Amity Univ Uttar Pradesh	6	214
12	Annamalai Univ	6	1
13	Assam Agr Univ	6	2
14	GB Pant Univ Agr & Technol	6	9
15	Indian Inst Sci	6	265
16	Sardar Vallabhbhai Patel Univ Agr & Technol	6	0
17	Coll Agr	5	1
18	ICAR Indian Agr Res Inst	5	5
19	ICAR Res Complex	5	4
20	Mizoram Univ	5	2
21	Univ Agr Sci Bangalore	5	0
22	Univ Hort Sci	5	3
23	CCS Haryana Agr Univ	4	0
24	Cent Agr Univ	4	0
25	Cent Inst Subtrop Hort	4	6

Based on research output, details of institutions ranked based on their performance in the field of horticulture are given table 3. For the study period, the first place was Dr. Yashwant Singh Parmar Univ Hort & Forestry with 19 articles, and TGCS Score was 24. The University of Agricultural Science, Bangalore has ranking second place with 18 records and TGCS 34. Third place for the Punjab Agricultural University by 13 published records with 23 numbers for TGCS.

Table. 6. The frequency of keyword wise in horticulture research output in India (Top 25)

Sl.No	Keywords	Records	TGCS
1	INDIA	73	221
2	GROWTH	61	64
3	EFFECT	56	44
4	HORTICULTURE	49	193
5	YIELD	49	102
6	QUALITY	40	220
7	USING	35	89
8	PRODUCTION	28	83
9	DIFFERENT	26	73
10	INTEGRATED	24	77
11	SOIL	24	188
12	ANALYSIS	23	77
13	SYSTEM	22	101
14	FRUITS	21	86
15	MANAGEMENT	21	68
16	USE	21	98
17	WESTERN	21	75
18	FRUIT	20	58
19	LAND	20	659
20	PLANT	20	101
21	SYSTEMS	20	110
22	DEVELOPMENT	19	32
23	WATER	19	200
24	NUTRIENT	18	46
25	GENETIC	17	30

From collected data, it is interesting to note that 1717 keywords found in the results of the horticulture research in India. Among the keywords, “India” 73 times occurred, “growth” has 61 times, “effect” has 56 times, “horticulture” and “yield” 49 times appeared in the data on research output. The highest Global citation scores for the keyword search was “land” for 659 times. “India” for 221 times, “quality” for 220 times and “water” for 200 times, and all other keywords appeared less than 200 times only.

Conclusion

Horticultural research output in India has shown significant publications made in terms of five different types of research documents that appeared in data retrieved from the Web of Science. For the study period (2001 to 2019), data collected from the online indexing database

and analyzed. Totally 267 research articles are a significant share among the 441 records found in the study period. The total number of authors involved in published research documents is 1192 in different journals (202 nos.), and a total number of keywords mostly occurred in 1717. The highest number of publications made by Indian researchers was 46 in the year 2018. Among the journals, the Indian Journal of Agricultural sciences retained first place with 62 papers. The most prolific author was Singh DB, with 15 articles. Dr. Yashwant Singh Parmar Univ Horticulture and Forestry” published the highest number of research articles as compared to other institutions in India.

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