

Research Trend of Horticulture Department, Assam Agricultural University, Jorhat, India during 1987-2020: A Bibliometric Analysis

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ABSTRACT

This paper provides the publication trends of Horticulture Departments under Assam Agricultural University during the year 1987-2020 that are indexed in Scopus database. This study mainly brings into focus on the year-wise investigation results, types of documents, authorship pattern, top ten journals, and highly cited papers of AAU. It is found that 74 papers received 765 citations published from the Horticulture Department during the year 1987- 2020. Departments of Horticulture under AAU, Jorhat preferred to publish their work in joint authorship mode. The maximal number of papers 15 (20.27) were published in Annals of Biology. Occurrences of keywords were determined using VOSviewer software.

Keywords: Horticulture; Horticultural sciences; Bibliometrics; Research productivity; Assam Agricultural University; VOSviewer

INTRODUCTION

Horticulture is the science, art, and practice of cultivating garden crops, mainly fruits, vegetables, and ornamental plants. The word "horticulture" is derived from the Latin word "hortus" mean "garden," and "cultura" mean "to cultivate" (Wikipedia, 2021). Assam Agricultural University, Jorhat is agricultural research university established in Jorhat, imparting education in agriculture and allied fields and also involve in conducting research. AAU, Jorhat incorporated 52 years ago on 1st April 1969. The Horticulture Department of AAU is one of the oldest departments. The Department of Horticulture was established in 1948 as a part of Assam Agricultural College (aau.ac.in, 2021). The current study focuses on the scientific contributions made by the faculty members of the Department during the period 1987-2020.

LITERATURE REVIEW

Deepthi and Tadasad (2019) noticed that collaboration among the researchers of

University of Agricultural Sciences, Dharwad within the same departments is dominant in cooperation other nature of collaborations. Department of Plant Pathology shows maximal number of collaborated articles. A study by (Manzano, Cardenas and Agugliaro, 2020) identifies that the worldwide contribution on medicinal plants is concentrating more on exploring novel medicines or active compounds. Analysis reveals that Pharmacology, Toxicology and Pharmaceutics category accounts 27.1 % of the whole publications and only 11% of publications are categorized under Agricultural and Biological Sciences subject. Nagarkar, Veer and Kumbhar 2015) using WoS database found that productivity of faculty members of life sciences departments under Savitribai Phule Pune University shows steadiness in growth rate of publications. Majority of paper were published in Biology. The faculties published their research results in journals having an Impact Factor of one or more. (Ng, Mustaffa and John, 2019) examined the output of specialized young university less than 50 years old in Malaysia by assessing impact of co-authorship in the discipline of science, technology, engineering and mathematics internationally. The results showed that faculty members of the university mostly collaborated with researchers from Asian institutions. Annual citation per article (Cpp) indicated that joint effort with European countries researcher's present highest impact for the mean Cpp. (Pradhan and Ramesh, 2017) analyzed the research production of Engineering Sciences branch of Indian Institute of Technology Madras and Bombay appeared in Scopus. Both IITs prefer to publish their research output in journals published from the Western countries such as USA, UK and Germany etc. Different bibliometric indicators were used such as Total Number of Publications (TNP); Total Number of Citations (TNC); Citations per Paper (CPP); and Relative Citation Impact (RCI) to assess the research performance. Scientists of both the IITs published maximal in the area of material science. (Bansal, Bansal, Saini and Gupta, 2015) analyzed the growth and the contribution of research explored by the faculty members of Mathematics discipline of Panjab University. A total number of 230 research paper were indexed in Scopus for the period of ten years (2005-14). The results reveal that publications have increased at an average growth rate of 17.15% annually and average citation impact per paper of 2.92 and impact factor per paper of 0.89. Majority of publications (35.96%) were the result of national collaboration during 2005 - 14 and highest number of papers were published in algebra with 28.7% of total share.

THE OBJECTIVES OF THIS RESEARCH ARE TO:

- i. Assess the research output of the Horticulture Department, AAU, Jorhat;
- ii. Examine the distribution of papers;
- iii. Analyze the authorship pattern;
- iv. Evaluate the most cited journals during the period under study;
- v. Find out the most highly cited papers;
- vi. Analyze keyword co-occurrence.

METHODOLOGY

This study is aimed to make bibliometric analysis of the research publications of Horticulture Department of Assam Agricultural University, Silchar which are index in Scopus database. The research data was collected from Scopus database on 22nd February

2021 by using the “Affiliation search” “Assam Agricultural University India” and then limit the department to Horticulture Department manually (www.scopus.com, 2021). A total of 74 papers were downloaded and then the collected data were scrutinized with the help of MS- Excel. VoSViewer software tools were employed to create a keyword co-occurrence map based on the retrieved bibliographic data.

RESULTS AND DISCUSSION

(a) Year-wise productivity and citations

Table 1 shows that the number of publications produced by AAU in horticulture consists of 74 papers during 1987-2020 and highest number of papers was published in 2017 with 9 papers. During the period of the study, a total of 765 citation were received by 74 publication.

Table 1: Year-wise productivity and citations

Year-wise productivity and citations				
Sl.no	Publication Years	Records	%	TC
1	1987	2	2.70	39
2	1997	3	4.05	2
3	1998	2	2.70	3
4	1999	2	2.70	8
5	2000	1	1.35	0
6	2001	1	1.35	18
7	2002	1	1.35	5
8	2003	1	1.35	244
9	2004	2	2.70	7
10	2005	2	2.70	3
11	2006	3	4.05	290
12	2007	1	1.35	0
13	2008	4	5.41	55
14	2009	3	4.05	14
15	2010	6	8.11	44
16	2011	1	1.35	7
17	2012	3	4.05	0
18	2013	1	1.35	1
19	2014	4	5.41	5
20	2015	6	8.11	6
21	2016	8	10.81	4
22	2017	9	12.16	3
23	2018	3	4.05	6
24	2019	3	4.05	1

25	2020	2	2.70	0
Total		74	100	765

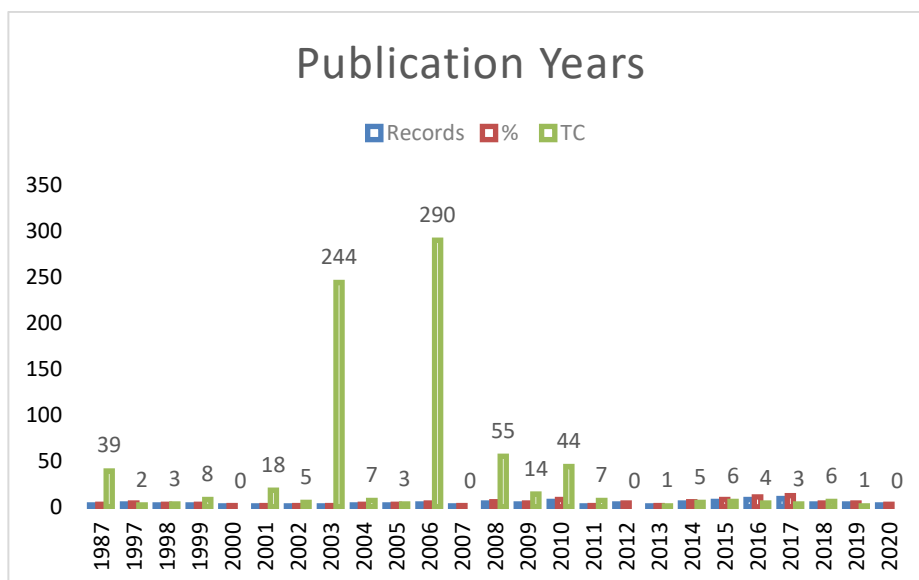


Figure 1: Publication Years

(b) Distribution of papers by types of document

The type of publications or mode of communication of research contribution of horticulture department under AAU, Jorhat during 1987-2020 are listed in Table 2. Of the 74 publication, 90.54% (67) appeared as articles, 5.41% (4) as review papers, 4.05% (3) as conference paper.

Table 2: Types of Document

Sl. No.	Publications Forms	Records	Percentage
1	Article	67	90.54
2	Review	4	5.41
3	Conference Paper	3	4.05
Total		74	100.00

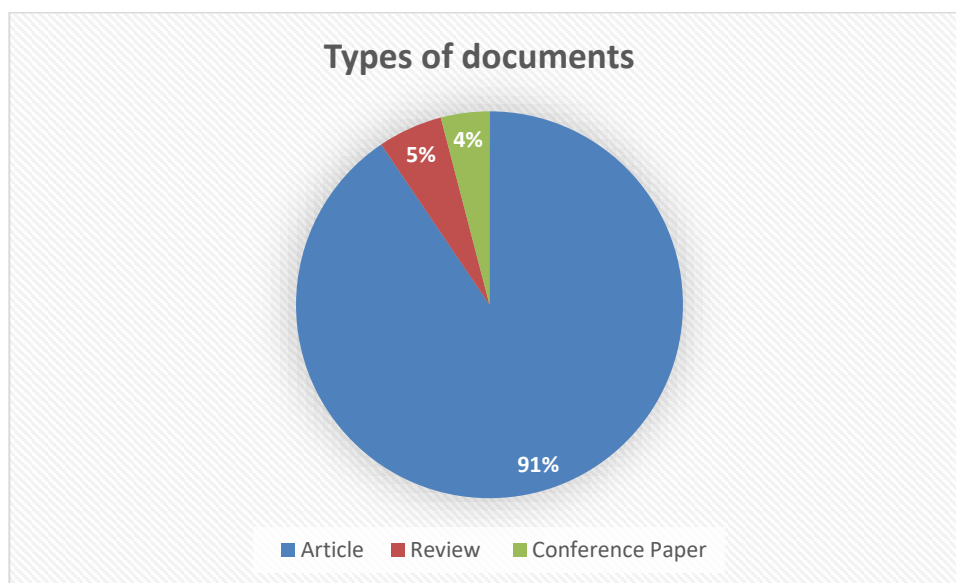


Figure 2: Types of Documents

(c) Authorship pattern

Table 3 shows authorship pattern that reveals that majority of Faculty members of Horticulture Department, AAU Jorhat preferred to publish the research results in joint authorship mode than single authorship. This shows that researchers tend to publish their research work with three and four authors.

Table 3: Authorship pattern

Sl. No	No. of Authors	No. of papers	Percentage (%)
1	Single Author	3	4.05
2	Two Authors	14	18.92
3	Three Authors	27	36.49
4	Four Authors	21	28.38
5	Five Authors and more	9	12.16
Total		74	100

(d) Top ten Journals

Journals are considered as one of the prime sources of information which are preferred by researchers to disseminate their research results. A list of top 10 journals which were found to be most productive, publishing 3 and more papers are given in Table 4. The maximal number of papers (19) were appeared in Annals of Biology, followed by Asian Agri-History, etc.

Table 4: Distribution of Journals

Rank	Journals	No. of Records (n=74)	Percent (%)	Cumulative No. of Articles	Cumulative Percentage (%)
1	Annals of Biology	15	20.27	15	20.27
2	Asian Agri-History	13	17.57	28	37.84
3	Biopesticides International	13	17.57	41	55.41
4	Current Science	10	13.51	51	68.92
5	Ecology, Environment and Conservation	9	12.16	60	81.08
6	Food Chemistry	7	9.46	67	90.54
7	5 Journals with 2 papers each	4	5.41	71	95.95
8	13 Journals with 1 paper each	3	4.05	74	100
Total		74	100		

(e) Highly cited paper

7 papers of Horticulture Department, AAU Jorhat received 10 and more than 10 citations. Table 5 listed the top 7 papers in descending order. The paper authored by B.N. Hazarika received highest number of citations i.e. 287 and the paper was included in "Scientia Horticulturae" in 2006.

Table 5: Highly cited paper

Rank	Title of the paper	Authors	Source title	Publication Year	Times Cited
1	Morpho-physiological disorders in in vitro culture of plants	Hazarika B.N.	Scientia Horticulturae	2006	287
2	Acclimatization of tissue-cultured plants	Hazarika B.N.	Current Science	2003	244
3	Antibacterial activity of the crude extract of Chinese green tea (<i>Camellia sinensis</i>) on <i>Listeria monocytogenes</i>	Mbata T.I., Debiao L.U., Saikia A.	African Journal of Biotechnology	2008	50
4	Control of post-harvest pericarp browning of litchi (<i>Litchi Chinensis</i> Sonn)	Neog M., Saikia L.	Journal of Food Science and Technology	2010	31
5	Changes in chemical composition of the kew	Kermasha S., Barthakur	Journal of the Science of	1987	29

	cultivar of pineapple fruit during development	N.N., Alli I., Mohan N.K.	Food and Agriculture		
6	Application of mixtures methodology for beverages from mixed fruit juice/pulp	Deka B.C., Sethi V., Parsad R., Batra P.K.	Journal of Food Science and Technology	2001	18
7	Chemical composition and proposed use of two semi-wild tropical fruits	Kermasha S., Barthakur N.N., Mohan N.K., Arnold N.P.	Food Chemistry	1987	10

(f) Analysis Co-occurrence of Keywords

VOSviewer is a software which create maps based on visualization of similarities in terms of co-occurrence of authorship, keywords, citation etc. (Jan van Eck & Waltman, 2010). This software tool used bibliographic data available from four different databases (Scopus, Web of Science, Dimensions and PubMed) to construct a network (<https://www.vosviewer.com/>, 2021). VOSviewer (version 1.6.16) was used for visualizing the co-occurrence of all keywords (author keywords and index keywords) for the current study. The top 5 keywords appeared in the visualization map were banana (8) followed by yield (7), India (5), Assam (5) and lycopersicon esculentum (5). The results are presented in Fig. 3.

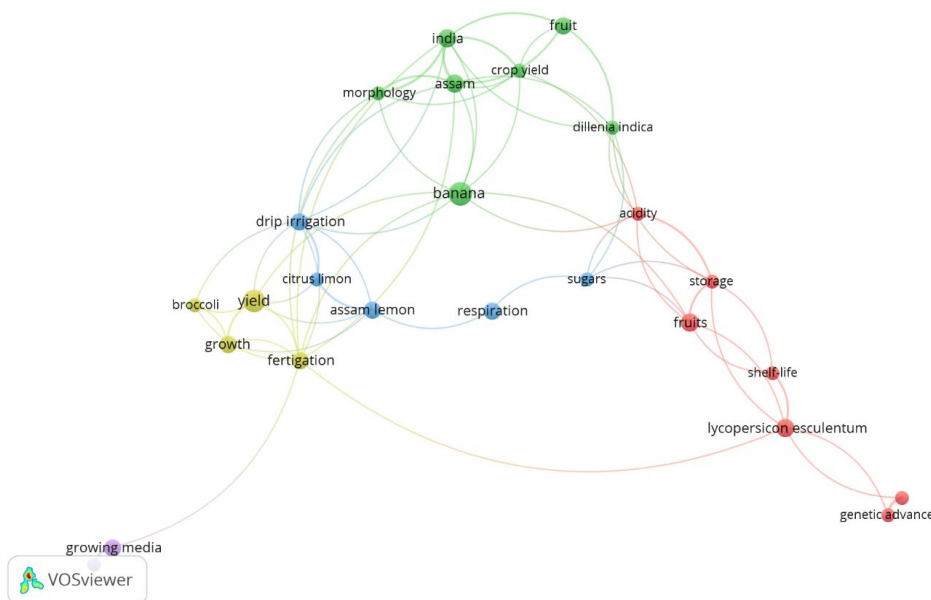


Figure 3: Frequently occurred keywords

CONCLUSION

Horticulture focuses on fruit, vegetables, ornamental flowers, and many more, instead of staple food or crops (<https://web.archive.org>, 2021). Horticultural research improves

health and quality of life for the world at large. Horticulture signifies health. The factors of good health for the people of the nation based on the production, consumption of horticultural products (<http://nhb.gov.in>, 2021). Horticultural research became one the vital field of study in the last few decades. Several bibliometric studies have been conducted to distinct disciplines. Based on the bibliographic data appeared Scopus, this study highlights the research productivity of Horticulture Departments of AAU, Jorhat. shows that the researchers are very active in their research investigation. The major findings manifest a trend of growth in publications associated with horticulture productivity. According to the findings, 74 papers received a total of 765 citations. Only 4.05 % of paper contributed by single author. Annals of Biology published the most articles (20.27 per cent), followed by Asian Agri-History (17.57 per cent). The utmost citations were received by "Morpho-physiological disorders in in vitro culture of plants" by B. N. Hazarika which was published in "Scientia Horticulturae" in 2007. VOSviewer was also employed to construct a map of frequently occurring keywords.

REFERENCES

- Assam Agricultural University. 2021. "Horticulture." <http://www.aau.ac.in/colleges/departments/college-of-agriculture/horticulture/about/1/10>.
- Bansal, Madhu, Jivesh Bansal, Harinder Singh Saini, and B. M. Gupta. 2015. "Contribution and Citation Impact of Panjab University in Mathematics Research during 2005-14." *Library Philosophy and Practice*. <http://digitalcommons.unl.edu/libphilprac/1325>.
- Deepthi and Tadasad, P. G. 2019. "Collaborative Research in University of Agricultural Science, Dharwad, Karnataka, India." *Journal of Indian Library Association* 55 (4): 25-34. <https://www.ilaindia.net/jila/index.php/jila/article/view/348/168>
- Eck, Nees Jan van, and Ludo Waltman. 2010. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics* 84 (2): 523-538. <https://doi.org/10.1007/s11192-009-0146-3>
- Leiden University. n.d. "VOSviewer - Highlights". <https://www.vosviewer.com/features/highlights>.
- Nagarkar, Shubhada, Chaitanya Veer, and Rajendra Kumbhar. 2015. "Bibliometric Analysis of Papers Published by Faculty of Life Science Departments of Savitribai Phule Pune University during 1999-2013." *DESIDOC Journal of Library & Information Technology* 35 (5): 368-375. <https://doi.org/10.14429/djlit.35.5.8429>
- National Horticulture Board. 2021. <https://web.archive.org/web/20190502082101/https://horticulture.umn.edu/students/why-horticulture>.
- Ng, Cheng Yee, Zahiraniza Mustaffa, and Kurian V. John. 2019. "Impact of International Co-Authorships to a Young Malaysian University Specialising in Science, Technology, Engineering and Mathematics." *DESIDOC Journal of Library & Information Technology* 39 (5): 238-243. <https://doi.org/10.14429/djlit.39.5.14699>
- Pradhan, Banalata, and D. B. Ramesh. 2017. "Scientometrics of Engineering research at Indian Institutes of Technology Madras and Bombay during 2006-2015." *DESIDOC Journal of Library & Information Technology* 37 (3): 213-220. <https://doi.org/10.14429/djlit.37.3.10967>.

- Salmerón-Manzano, Esther, Jose Antonio Garrido-Cardenas, and Francisco Manzano-Agugliaro. 2020. Worldwide research trends on medicinal plants. *International Journal of Environmental Research and Public Health* 17 (10): 3376. <https://doi.org/10.3390/ijerph17103376>.
- Scopus. 2021. "Affiliation Details - Assam Agricultural University India." <https://www.scopus.com/affil/profile.uri?afid=60021252>.
- University of Minnesota. 2019. "Why Horticulture?". <https://web.archive.org/web/20190502082101/https://horticulture.umn.edu/students/why-horticulture>.
- Wikipedia. 2021. "Horticulture." <https://en.wikipedia.org/wiki/Horticulture>.