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INFORMATION SOURCES IN THE FIELD OF HORTICULTURE WITH SPECIAL REFERENCE TO POMOLOGY: A CASE STUDY OF COMMONWEALTH AGRICULTURAL BUREAU (CAB) ABSTRACTS

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Abstract: Our motherland is very rich in variety of soil and agro-climatic zones. This richness is reflected through the diversity in crop production in India. Cultivation of horticultural crops mainly, fruits, vegetables and flowers start dominating over the food crop cultivation for the last 10-15 years. Effective information support becomes utmost important in these fields to enhance the production rate. 'Pomology' is a branch of 'Horticulture' whose domain is 'Fruit cultivation'. In this article, the information sources in the field of 'Pomology' have been identified. One of the major abstracting sources i.e. CAB Abstracts in the field of 'Pomology' have been scanned from the year 1992 to 2016. Year wise publication of important sources of information in the subject under study has been analyzed and results have been interpreted. The trends of research in the specific subject field have also been traced.

Keywords: Pomology, CAB, Horticulture, NHM, Information sources, ICAR

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1. Introduction

India has a favourable climate and soils for growing a wide variety of horticultural crops such as fruits, vegetables, potato, tropical tuber crops, mushrooms, ornamental plants, medicinal & aromatic plants, spices and plantation crops, covering coconut, arecanut, cashew nut, cocoa, tea, coffee and rubber.

Soon after independence, India faced the challenge of providing food security to million of its people. The R & D initiatives taken by the Government of India resulted in the 'Green revolution' in the late 60's and early 70's. However, it was only in mid 80's that the Government of India identified 'Horticulture Sector' as a means of diversification for making agriculture more profitable through efficient land use, optimum utilization of natural resources and creating skilled employment for rural masses.

The R & D programmes in horticulture have received an impressive support from the 8th Five-Year plan onwards. As a result, the research infrastructure has increased with the setting up of a number of new institutes, National Research Centers in several crops which are important from both from domestic and export point of view. Development of infrastructure in the Ministry of Agriculture and Ministry of Commerce has been created to take care of production and trade of important horticultural crops. At present, 10% of the ICAR budget and 17% of the Department of Agriculture & Co-operation budget is earmarked for Horticulture sector in the Ninth Plan. The above efforts combined with growers' enthusiasm for horticultural crops have yielded a good output. Horticulture Sector covering only 8% of the total crop area of the country, contributes 24.5% to the GDP and 54.55% to export earnings in agicultural sector.(National Horticulture Board, Government of India, 2015)

The 'National Horticultural Mission' (NHM) was launched during the year 2005-06 to provide a thrust to the development of horticulture in the country. During the implementation of this mission it was realized that some additional components need to be introduced to achieve objective the holistic growth of the horticulture sector. Accordingly, some new components ,such as 'high density plantation', 'mushroom cultivation' , 'horticulture mechanization' , GAP Certification' etc. have been included in the mission. In the last financial year (2014 – '15) an

amount of Rs.2511.00 crore has been allocated under the budget head 'Mission for Integrated Development of Horticulture' (MIDH). (Ministry of Agriculture, Government of India, 2013)

Fruits and vegetables account for nearly 90% of total horticulture production in the country. India is now the second largest producer of fruits and vegetables in the world and is the leader in several horticultural crops, namely mango, banana, papaya, cashew-nuts, areca nut, potato and okra. However the nature of horticulture crops being such it is not easy to make assessment of their production.(Ministry of Agriculture, Government of India, 2013)

2. Objective of the study

The objectives can be identified as follows:-

a. To identify different sources of information in the field of Pomology.

b. To know the information availability in the field in the field of Pomology.

c. To find out the publication trend in the area of 'Pomology'.

d. To find out the growth of research in the field of 'Pomology'.

3. Scope and coverage of the study

The study covers the subject field 'Horticulture' and specifically the branch 'Pomology'. In the present study, the type of sources has been identified along with a few examples. But, the structure of the sources along with the retrieval options are not explained in detail as in-depth study is not possible in this short span. The time span of the study has been taken up to 2016. The researcher has tried to cover all the available sources in the field of Horticulture specially Pomology. CAB abstracts have been scanned and year wise output of various types of documents has been recorded. The CAB database of last 15 years i.e. from 1992 to 2016 has been taken into consideration.

4. Methodology

The researcher has tried to find out the broad categories of information used in different levels. The different sources of information have been identified and data collected from CAB abstracts on these information sources in the field of Pomology. Data analyzed in tabular form along with

discussion thereon. Finally, conclusion has been drawn by the researcher on the basis of the findings and discussion.

5. Broad categories of Information

The information that are either generated or used can be broadly grouped into the following categories-

a. Natural resources of the country
b. Data related to research projects
c. Regional natural/infrastructural resource maps
d. Plan/Non-plan scheme monitoring
e. Personal information related to scientific, technical and other staffs
f. Institutional inventory
g. Finance, Budget and expenditure
h. Technologies generated
i. Genetic biodiversity resources
j. Meteorological data
k. Horticultural inputs, infrastructure and output data
l. Market intelligence i.e. price, trade and commerce
m. Human resource development
n. Village level information
o. Administrative records i.e. MoUs, agreements etc.
p. Information on library inventory
q. Produce management like imports, exports and distribution data

6. Categories of the major sources of information

Depending upon the identified used information categories, the major sources in the field of Horticulture and specifically in 'Pomology' has been identified and categorized. These are Books, Journal article, Conference paper, Correspondence, Editorial, Thesis, Patent, Standard, Miscellaneous (includes Administrative records, Minutes of meeting, different informal communication, Radio and TV talks, Pamphlets etc.), Bulletin, Bulletin article and Annual report.

7. CAB Abstracts

There is a no. of life sciences databases in the field of agriculture. Among those seven databases are worth mentioning. (Bhat, 1990) These are as follows:

a. AGRICOLA from the U.S. National Library (NAL)
b. Biological and Agricultural Index Plus from H.W. Wilson Company
c. Biological Abstracts (BIOSIS) from Institute of Scientific Information (ISI)
d. CAB Abstracts from Commonwealth Agricultural Bureau (CAB) International
e. Cambridge Scientific Abstracts (CSA)
f. Life Sciences Collection from (CSA)
g. Science Citation Index Expanded known as Web of Science from ISI.

The study of Kawasaki (2004) shows that a search in CAB Abstracts for Agriculture journal literature garners the most results rather than search in any or all of the other life sciences databases which would be a duplication of effort. (Kawasaki, 2004)

CAB Abstracts provide researchers instant access to over 8.4 million records from 1973 onwards, with over 360,000 abstracts added each year. Its coverage of the applied life sciences includes agriculture, environment, veterinary sciences, applied economics, food science and nutrition. CAB Abstracts now includes 'Full Text Select', a growing list of more than 40,000 full-text documents, including conference proceedings, reports, and difficult-to-find journal full text from around the world. The repository contains PDF full text including journal articles in English and non-English languages; conference proceedings frequently offering important papers months before the completed research paper is published; book chapters, monographs, government reports, and more. CAB Abstracts Full Text Select offers records from 2003 to date, with approximately 10,000 new records added each year.(CAB International, 2018)

8. Data Analysis

8.1 Distributions of information sources (Books , Journal articles, Conference Papers, Correspondences, Editorials, Theses, Patents, Standards & Miscellaneous) on Pomology

Table – I: Information sources (Books, Journal articles, Conference Paper, Correspondence, Editorial, Patent, Standard, Thesis and Miscellaneous documents)

Year	Number of Books	Number of Journal articles	Number of Conference Papers	Number of Correspondence	Number of Editorial	Number of Patent	Number of Standards	Number of Theses	Number of Misc.
2016	3	5418	1639	14	0	0	0	7	8
2015	2	5460	761	0	0	0	0	5	0
2014	5	9940	1173	3	1	0	0	6	1
2013	11	9614	1147	5	1	0	0	4	5
2012	16	9686	1704	10	0	0	0	7	4
2011	30	8751	1064	1	0	0	0	5	5
2010	22	8103	1441	2	0	0	0	9	2
2009	22	7544	1446	6	0	0	0	4	1
2008	28	6669	1370	6	1	0	0	4	4
2007	32	6543	1126	1	0	0	0	11	20
2006	24	5833	1114	3	0	0	0	5	3
2005	48	5542	1141	1	1	0	0	6	8
2004	46	5283	1059	4	0	0	0	7	10
2003	51	5043	1025	1	0	0	0	4	12
2002	43	4618	1064	0	0	0	1	7	14
2001	44	4288	779	0	0	0	0	9	11
2000	39	5276	504	0	0	0	0	9	31
1999	41	6802	556	0	0	0	0	7	114
1998	50	5851	244	0	0	0	0	1	103
1997	48	5605	179	0	0	0	0	1	126
1996	55	4664	302	0	0	0	0	3	75
1995	58	5566	361	1	0	0	0	1	98
1994	54	5402	411	0	0	0	0	1	108
1993	48	4678	244	2	0	0	0	2	138
1992	52	4519	209	1	0	0	0	2	146

Discussion – From the above table it can be said that 4519 no. of books have been published in the year 1992 and 9940 no. of books have been published in the year 2014.

The above table shows that only two books have been published in the year 2015, whereas 58 no. of books have been published in the year 1995.

After analyzing the above table it can be said that no. editorial has been published in 2015-16, 2009 -2012, 2006-07, 1992-2004. Only 1 editorial has been published in the year 2013 -14, 2008 & 2005.

The above table represents that no correspondence has been published in the years 2015, 1996 – 2002 & 1994. A maximum no. of correspondences have been published (i.e. 14 nos.) in the year 2016. Only I no. of correspondence has been published in the year 2011, 2007, 2005, 2003, 1995 & 1992.

The above table shows that 179 nos. of conference paper have been publishes in the year 1997 and a maximum no. has been published (i.e. 1704 nos.) in the year 2012.

The above table shows that no miscellaneous documents published in the year 2015. A maximum no. of miscellaneous documents (i.e.146 nos.) published in the year 1992. A minimum no. of documents (i.e. 1 no.) published in the year 2009 & 2014 respectively.

The table depicts that no patent published in the year 1992 – 2016. It can be concludes that only 1 standard has been published in the year 2004 and no patents have been published in the year 2003-2016 & 1992 – 2001.

As thesis is concerned, it can be said that only 1 no. of thesis published in 1997-98 & 1994-95. A maximum no. of 11 theses has been published in the year 2007.

8.2 Distributions of information sources (Annual Reports, Bulletin & Bulletin article) on Pomology

Table-2: Information sources (Annual Report, Bulletin, Bulletin article, Conference Proceedings, Book chapter & Journal issue)

Year	Number of Annual Report	Number of Bulletin	Number of Bulletin Article	Number of Conference Proceedings	Number of Book Chapter	Number of Journal Issue
2016	0	3	26	5	16	8
2015	0	2	1	15	19	5
2014	0	20	0	25	34	15
2013	0	19	4	23	51	14
2012	2	28	1	31	100	10
2011	2	32	5	25	206	14
2010	0	85	7	30	89	15
2009	0	42	2	30	80	11
2008	2	40	9	38	132	4
2007	1	29	0	18	151	9
2006	2	44	13	41	177	7
2005	1	58	3	30	115	5
2004	4	58	9	32	88	5
2003	5	67	5	32	123	4
2002	6	82	8	23	56	9
2001	4	66	12	24	65	5
2000	10	109	6	24	62	3
1999	11	4	0	28	40	0
1998	16	8	0	27	41	0
1997	10	0	0	27	23	0
1996	13	0	0	21	14	0
1995	19	0	0	33	5	0
1994	13	0	0	34	28	0
1993	24	0	0	28	27	0
1992	31	0	0	18	23	0

Discussion: -- The above table depicts that no 'Annual Report' has been published in the years 2013-16 & 2009 -10. A maximum no. of 'Annual Report' has been published (i.e. 31 nos.) in the year 1992. The minimum no. documents published (i.e. 1 no.) in the year 2005 & 2007.

It is clear from the above table that no 'Bulletin' has been published in the year 2014, 2007 & 1992 – 1999. A maximum no. of 'Bulletin has been published (i.e. 109) in the year 2000 and the minimum no. of documents published (i.e. 2 nos.) in the year 2015.

As 'Bulletin article' is concerned, the table signifies that no 'Bulletin article' has been published in the year 2014, 2007 & 1992-1999. The maximum no. of documents have been published (i.e. 26) in the year 2016. The minimum no. of documents (i.e.1 no.) has been published in the year 2012 & 2015.

The 'Book Chapter' column shows that the maximum no. of 'Book Chapter' (i.e. 206 nos.) has been published in the year 2011.The minimum no. of documents (i.e.5 nos.) has been published in the year 1995.

The above table represents that a maximum no. of 41 nos. of 'Conference Proceedings' have been published in the year 2006 and the minimum no. (i.e. 5 nos.) of the same has been published in the year 2016.

The analysis shows that no 'Journal Issue' has been published in the year 1992 – 1999. It also shows that a maximum no. (i.e. 15 nos.) of 'Journal Issue' have been published in the year 2014 and a minimum no. (i.e. 3 nos.) has been published in the year 2000.

9. Conclusion

After completion of the study, it can be said that 'CAB Abstracts' provide lots of information in the field of 'Pomology' which is a branch of 'Horticulture'. The data collected from 1992 to 2016 with a view to a specific subject i.e. 'Pomology' in a pin-pointed and exhaustive manner.
The major sources of information are journal articles, conference papers, books, book chapters, conference proceedings etc. The analysis shows that the main source of information is journal

article which is maximum in quantity. The other sources of information like Conference papers, Books, Book chapters, Conference Proceedings, Bulletin, Bulletin articles, Editorial, Theses, Patents, Standards and Miscellaneous occupy their positions in decreasing order.

As the result shows that the number of Journal articles increase steadily year wise, it can be said that the research trend is growing significantly in the subject field under study.

As the result reflects that the number of Conference paper increases remarkably, it may be opined that the research in the concerned subject is gradually uprising.

Information plays a vital role in the field of study and research in every sphere of knowledge. Horticulture is a growing and potential subject field and 'Pomology' is also gaining its importance day by day. Different topics and sub-topics are evolved to enrich this subject and it is occupying its position in the universe of subjects and gaining its importance day-by-day. In this connection, it is also important to state that our country occupies the second position in the production of fruits throughout the world due to the impact of the application of the research output from the 'Lab to Land'.

Therefore, the role of information sources is also worth mentioning in the above mentioned subject. These information sources are the basis weapons of the research scholars, scientist and faculties of the subject field under study.

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