

Library Science. 32; 1995. Paper U

GROWTH OF RESEARCH IN OILSEEDS AND COLLABORATION TRENDS: A CASE STUDY

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The paper discusses the results of an informetrics study of the issues of the Journal of Oilseeds Research published during 1984-1993. It emphasizes on the key role played by the Indian Society of Oilseeds Research and its journal in the dissemination of oilseeds information in India. A list of ten core periodicals of oilseeds research were identified based on the citation analysis of the journal. Authorship pattern and collaboration coefficients were studied and reported.

KEY WORDS/DESCRIPTORS: Oilseeds; Collaboration trends; Core Periodicals.

1 INTRODUCTION

An organised research effort on annual oilseeds started with the establishment of All India Co-ordinated Research Project on Oilseeds (AICORPO) in 1967 covering five crops viz., groundnut, rapeseed-mustard, sesame, linseed and castor involving 32 research centres in India. This network presently consists of 47 research centres spread over 17 different states covering six crops viz., sesame, niger, sunflower, safflower, castor and linseed with a Directorate of Oilseeds Research, at Hyderabad backed up by five project coordinating units one for each of the principal crops. Besides there are three national research centres, one each for groundnut (Junagadh), soybean (Indore) and rapeseed-

mustard (Bharatpur) and in addition three All India Coordinated Research Projects on groundnut with 22 research centres, soybean with 14 research centres and rapeseed-mustard with 20 research centres. The core research activity on annual oilseeds in India has been concentrated in the said AICORPO network during the last twenty five years.

The research information on oilseeds generated in the AICORPO system is being disseminated through a variety of media, and periodicals form one of the most important channels of communication for disseminating nascent micro information on oilseeds. Quite a number of periodicals publish research articles and research notes on oilseeds.

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The Journal of Oilseeds Research published by Indian Society of Oilseeds Research with a membership of around six hundred was selected for analysis. Journal of Oilseeds Research disseminates research information on oilseeds in the country. Contributions from the members on any aspect of oilseeds research are considered for publication in Journal of Oilseeds Research.

Most of the oilseed research workers contribute to this journal. This is considered as the only comprehensive periodical on oilseeds research in India. Articles from this periodical are being regularly indexed and abstracted in AGRINDEX, abstracting periodicals of CABI and Biological Abstracts. An attempt was made to indentify core periodicals in Oilseeds Research based on citation analysis of the references covered in the journal for the period 1984-1990. Authorship patterns and collaboration trends are also reported. Similar studies were conducted from time to time by informetricians [3,2].

2 METHODOLOGY

The data on number of times a particular periodical title cited in references covered in the Journal of Oilseeds Research during 1984-1990 were recorded. A total of 1195 references from different periodicals were cited in articles published in Journal of Oilseeds Research. Subsequently 572 articles published in the Journal of Oilseed Research during 1984-1993 were also subjected to bibliometric analysis. The necessary bibliographic elements of each of the contribution were recorded and required analysis was carried out. Names of authors, number of authors, year of publication and discipline of each of the contributions were noted. Yearwise, cropwise and disciplinewise total number of contributions and also authorship distribution were noted. Collaborative coefficient in discipline and in crops was worked out. The degree of collaboration in a discipline was defined as the ratio of the number of collaborative research papers to the total number of research

papers published in a field during a certain period of time [4]

This can be expressed as:

$$\text{Collaborative Coefficient (CC)} = \frac{N_m}{N_m + N_s}$$

Where N_m is the multi-authored research papers in the discipline/field published during a year. Only two or more than two authors were considered multi-authored papers for analysis. N_s is the single-authored research papers in a discipline/field published during the same period.

The average authorship per paper (AAP) was worked out using the following formula [1]:

$$AAP = \frac{\sum A_i P_i}{P}$$

Where A_i is the number of authors contributing to the i th category ($i = 1, 2, 3, 4$) and P_i is the total number of papers in the i th category.

3 RESULTS AND DISCUSSION

The analysis for identifying core periodicals in oilseeds research resulted in the observation that 60 percent of the references cited in Journal of Oilseeds Research were published in top ten periodicals as listed in Table 1.

It was found that around 62% of the total number of papers published in Journal of Oilseeds Research during the decade were on groundnut (26%) followed by rapeseed-mustard (24%) and sunflower (12%). Incidentally, sixty percent of the total production of oilseeds kitty in the country is contributed by these three crops indicating fruitfulness of the research carried out on these crops. The total number of authors who contributed during the decade (1984-1993) were 1501. The number of authors who contributed in different crops are given in Table 2.

Table 1
Core periodicals of oilseeds research

Name of Periodicals	Year of First Volume	Number of times Cited	Percentage (As rounded off)
1. Indian Journal of Agricultural Sciences	1931	136	11
2. Agronomy Journal	1909	95	8
3. Indian Journal of Genetics and Plant Breeding	1941	93	8
4. Crop Science	1961	87	7
5. Indian Journal of Agronomy	1956	80	7
6. Oilseeds Journal (publication discontinued)	1971	48	4
7. Journal of Oilseeds Research	1984	47	4
8. Madras Agricultural Journal	1914	44	4
9. Indian Journal of Entomology	1939	41	3
10. Indian Farming	1951	40	3

Table 2
Range of collaboration coefficient during 1984-1993 in oil seeds

Crops	No. of single author papers	No of multi-authored papers	Total No. of papers	Total No. of authors	CC*
Groundnut	11	138	149	401	0.92
Rapeseed-mustard	15	122	137	344	0.89
Sunflower	2	69	71	218	0.97
Sesame	2	45	47	123	0.95
Soybean	2	36	38	96	0.94
Castor	6	23	29	66	0.79
Linseed	3	25	28	76	0.89
Safflower	5	22	27	76	0.81
Niger	3	16	19	43	0.84
General oilseeds	10	9	19	35	0.47
Minor oilseeds	0	8	8	23	1.00
Total	59	513	572	1501	0.86

Collaborative Coefficient

The first three prolific authors who have contributed to oilseeds research in terms of authorship are: 1. T.P. Yadava, 2. Hari Singh, and

3. Mangala Rai. All the three authors belong to Genetics and Plant Breeding discipline.

The average collaboration coefficient during the period 1984-1993 in different oilseed crops and in various disciplines worked out to 0.86 indicating healthy trend of collaborative research in oilseeds (Table 2). Among various disciplines, Agronomy had the highest average collaborative coefficient followed by Plant Breeding/Genetics, Physioillogy/Oil chemistry, Plant Pathology and Entomology. Similar trends were observed in average authorship per paper where the average number of collaborators was found 3 in all disciplines and in all years. Highest collaboration was noticed in Plant Breeding/Genetics followed by Agronomy, Plant Pathology and Entomology as given in Table 3.

Though an active collaborative research was observed in various disciplines in terms of average authorship per paper, it can not be concluded that research collaboration has been strictly interdisciplinary in nature. Observation of the contributors indicates that most of the contributors might belong to the same discipline in which they have contributed and it could only be treated as of shared authorship. Further, in

Table 3
Range of collaborative coefficient during 1984-1993 in different disciplines of oilseeds

Discipline	No. of single author paper	No. of multi-author paper	Total no. of papers	Total no. of authors	Collaborative coefficient (CC)	Average author per paper
Plant Breeding/ Genetics	19	202	221	593	0.91	3.68
Agronomy	15	188	203	553	0.92	3.72
Physiology/Oil Chemistry	2	18	20	47	0.90	3.35
Plant Pathology	6	43	49	125	0.87	3.55
Entomology	8	44	52	127	0.84	3.44

many contributions it is presumed that there could be 'shadow authorship' that is to say 'assigning authorship without significant contribution to the published articles. It is very difficult to establish the element of 'Shadow authorship' in cases of multi-authored contributions. A reasonable solution to eliminate this 'shadow element' would go a long way to draw realistic conclusions in bibliometric analysis of publications. Inter-disciplinary collaborative research is desirable in any scientific activity for increasing scientific productivity and oilseeds research is no exception to this and further confirmative studies are necessary in this direction.

Further, in view of the vital role that the Journal of Oilseeds Research has assumed among the oilseeds research workers world over, the following suggestions are offered towards further improvement of the journal.

1. Book reviews & Letters to the Editors may be made as a regular feature.
2. A comprehensive news package on Oilseeds Research & Development Scenario may be initiated.
3. In view of the fact that the Journal of Oilseeds Research is the only research journal in India on oilseeds, it is desirable that the frequency of the journal may be made either quarterly or monthly.
4. A comprehensive author and subject index to the volumes of Journal of Oilseeds Research may be published.

5. The journal may include current literature on oilseeds research and development preferably with abstracts to keep abreast of oilseed research workers with latest developments in oilseeds. This exercise needs a collaborative effort on the part of the Indian Society of Oilseeds Research with an active documentation centre in the area of oilseeds. The Society may explore the possibility of cooperative documentation of oilseeds research and development literature with the help of specialists in documentation and information for generating current awareness updates on oilseeds for publishing in the journal.

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