

# CITATION ANALYSIS OF PHD THESES IN AGRONOMY SUBMITTED AT CCSHAU AND PAU DURING 2010-2014: A COMPARATIVE STUDY

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**Abstract:** The study covers a total 2576 citations appended to the 14 doctoral theses in the field of Agronomy awarded by CCSHAU, Hisar and PAU, Ludhiana during the year 2010-2014 to find out the comparison in terms of bibliographic forms of the cited documents, authorship pattern, country-wise, year-wise distribution of citations and its obsolescence value. Ranking of the cited journals was also carried out with the application of Bradford's law of scattering. Analysis and interpretation was carried out with the help of tables and graphs. The findings reveals that highest number of citations are from journals i.e. (69.7%) in CCSHAU and (77.6%) in PAU, for their source of information followed by conference/seminar proceedings. The authorship pattern highlights that the maximum number of citations are (29.1%) in CCSHAU and (32.2%) in PAU from the two-authors, followed by three-authored articles in Agronomy. The country-wise scattering of citations reveals that 424(39.8%) and 416(50.9%) are from India in both the universities, followed by Netherlands in CCSHAU and USA in PAU. **Indian Journal of Weed Science** occupies the first rank in both the universities with 99(9.3%) and 101(12.3%) which is maximum in PAU as compared to CCSHAU. The study will be helpful for the librarians in the process of collection development and to weed out unused documents from the libraries to save costly stocking space and reduce maintenance cost. As due to the increasing cost of the journals and the shrinking library budgets, the librarians must make careful selections based on the qualities and standards of journals.

**Keywords:** Bibliometrics, Citation analysis, Bradford's law, Agronomy, CCSHAU, PAU

## 1.0 Introduction

The importance of agriculture in the economic development of any country, rich or poor, is borne out by the fact that it is the primary sector that provides the basic ingredients necessary for the existence of mankind and also provides most of the raw materials which when transformed into finished products serve as basic necessities of the human race. Agriculture contributes nearly half of the national income and provides employment to about 70% of the working population in India.<sup>1</sup>

The institutes and centre's belonging to the ICAR assumed responsibility for agricultural research and related fields both at the national and regional levels. Special emphasis was laid to the development of an agricultural research infrastructure immediately after Independence. The scenario has changed after the establishment of State Agricultural Universities (SAUs).<sup>2</sup> There are 44 State Agricultural Universities in our country and Rajasthan is the only state that has the maximum state agricultural universities (SAUs)

Citation study acts as a helping tool for the librarian to accomplish this and such a study not only helps the librarian to procure need-based information sources and develop quality collection, but also reduces cost while being judicious in choice and by avoiding duplication of documents. In addition, present study can also help the researchers in the field of Agricultural Sciences to understand the structure of the knowledge

## 2.0 Literature Review

**Tunga and Dasgupta (2013)** conducted a citation study on the use pattern of the cited literature in the field of horticulture by the agricultural scientists during the period of 1991-2010. A total of 10,845 citations appended to 80 doctoral theses were analyzed. Maximum theses were contribution from the department of Fruits and

Orchard Management on 'Mango' crop. Maximum cited journals belonged to India followed by USA. Bradford's Law did not fit well in journals and half-life of the journal articles was found to be 24 years. **Fasae (2012)** performed a citation analysis of dissertations and theses submitted to the department of agricultural economics and extension, Federal university of technology Akure, Nigeria. He found that nearly one-third of total citations were made to journal articles with (34.97%) citations followed by citations to books i.e. (256.15%) and conference proceedings with (15.31%) citations. The highest citations were recorded in 2006 with 1370 citations and least in 2007 having 181 citations. It was also found that more than half be (52.21%) were from single authorship and (32.40%) citations were from joint authorship. **Fagbola and Adejaro (2012)** carried out a study on citation pattern of the Nigerian Journal of Horticultural Science from 1990-2005. They found that Ahmadu Bello University contributed the highest number of articles with 72(30%) followed by University of Ibadan of 35(14.58%) articles. The result also shows that the National Horticultural Research Institute has the highest number of contributors among the Research Institutes with 45 (72.6%) citations followed by Cocoa Research Institute of Nigeria with 8 (13%) citations. They also found that university of Bonn. AufdenHugel, Germany had the highest number of authors with (33.3%). The authors/researchers in Nigerian Journal of Horticultural Science cited more journals 874 (46.86%) than books 540 (28.95%) from 1990-2005. It was observed by **Thanuskodi (2012)** who conducted a study on bibliometric analysis of Indian Journal of Agricultural Research that the maximum numbers of contribution were from joint authors with 564 (93.69%) citations. The study also reveals that majority of the contributions appeared under plant pathology 63(10.47%) followed by agronomy 57 (9.47%) citations. Similarly, most of the contributions were from India with (98.67%) citations, while foreign contributions were found very less. It further reveals that the highest contributions were from universities with 168 (27.9%) citations. Majority of the authors preferred journals as source of information with the highest number of citations 2269, (37.75%). **K.P.Singh (2012)** carried out the Information Use, Satisfaction, and Difficulties: A Case Study of Agricultural Scientists in India. The present study was an attempt to investigate the various issues such as information use, level of users' satisfaction, difficulties faced by agricultural scientists while seeking information, which help to the agricultural libraries and librarians in building their library collections more rationale. Seven hundred structured questionnaires were distributed among the agricultural scientists in the identified institutions of ICAR, out of which 375 questionnaires were received back with a response rate of 53.57%. **Sarkhel and Choudhary (2010)** undertook a bibliometric study based on the contributions of Bidhan Chandra Krishi Viswavidyalaya to agricultural research. A total of 2807 papers were identified and analyzed on seven different parameters. The result shows that journal articles contribute (95.11%) citations of the total publication followed by conference publication with (3.24%) citations. Among Indian Journals, Environment and Ecology (Rank 2.0) has the highest number of publications with 64 (25.27%) papers, whereas among foreign journals, Bulletin of Environmental Contamination and Toxicology occupied the highest numbers of publications of 18 (13.84%) papers. The result also shows that joint authors have contributed the highest number of research papers with 1077 (38.37%) citations of the total. **Madhu K.N (2015)** undertook a bibliometric analysis of the Indian Journal of Agricultural Research and covered three volumes (Vol.46 to 48) published between 2012 and 2014. In the field of agricultural sector, it was observed that collaborative research is predominated; the degree of collaboration in Indian Journal of Agricultural Research is 0.9638. Maximum research articles on agriculture sector were published during the year 2013 as compared to the years 2012 and 2014. Majority of the research articles in agriculture sector were contributed by the authors from the states of Haryana, Uttar Pradesh, Andhra Pradesh etc. Majority of the articles 42(19%) have a length of four pages, 42(19%) having a length of five pages. Maximum articles in the subject of Agronomy with 23(10.4%) citations, followed by Irrigation Genetics with 22(9.95%) were contributed by the agricultural scientists. The author V.K. Sharma has obtained the first rank and contributed 4(1.80%) articles.

### **3.0 Objectives of the Study:-**

The present study intends to find out the following key objectives:

1. To identify the bibliographic forms preferred by the agricultural scientists in the field of Agronomy
2. To find out the authorship pattern and degree of collaboration
3. To identify the year-wise distribution of cited journals
4. To identify the country-wise distribution of the cited journals
5. To prepare a ranked list of highly cited journals in the subject of Agronomy ,and
6. To examine the applicability of Bradford's Law of Scattering to the pattern of journals used by the researchers in agronomy.

**4.0 Scope and Limitations**

The bibliographic references appended at the end of doctoral dissertations in the field of Agronomy have been taken as the source data for the present study. The doctoral dissertations awarded during the period 2010-2014 were taken into consideration of two State Agricultural Universities of North India:

1. Chaudhary Charan Singh Haryana Agricultural University, Hisar (CCSHAU)
2. Punjab Agricultural University, Ludhiana (PAU).

**5.0 Limitations:**

Following are the limitations of the present study:

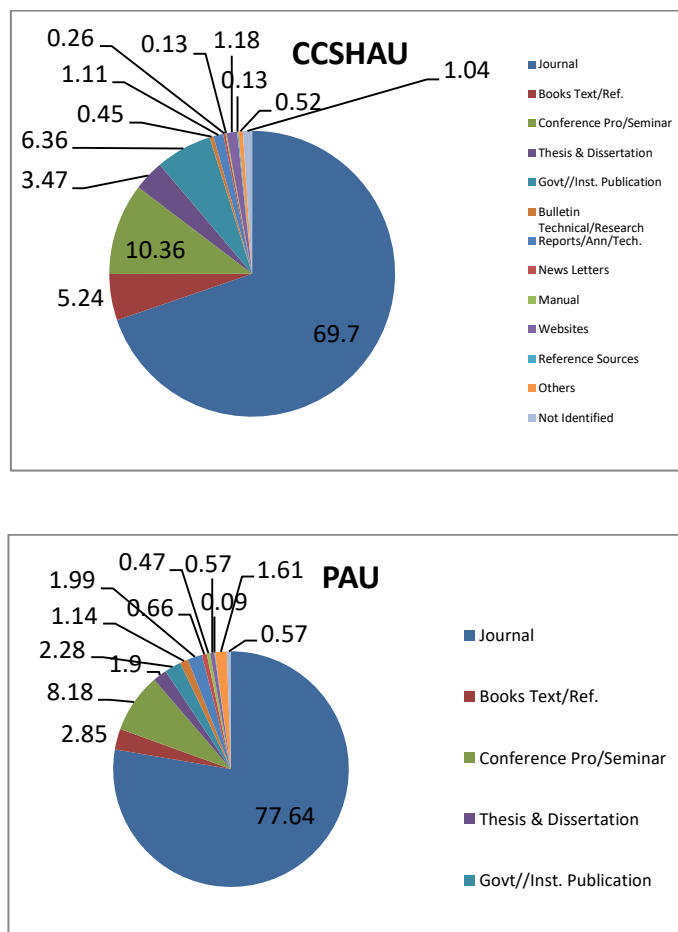
1. Study delimited to only the citations data exclusively found in the Ph. D. theses of Agronomy.
2. Only those doctoral theses in Agronomy, submitted to the universities understudy.
3. Only the citation data from those doctoral theses available/submitted during the period 2010-2014.
4. Each reference made at one time will be counted as one citation. If the same reference is repeated using 'ibid' or 'op. cit.', it has been counted separately.
5. Only journal was considered for further analysis of the study, not any other bibliographic forms.

**6.0 Methodology**

Data for the present study consists of a total of 2576 (1525+1051) citations appended to a total of 14 doctoral theses, i.e.9 from the Department of Agronomy of Chaudhary Charan Singh Haryana Agricultural University, Hisar (CCSHAU) and 5 from Punjab Agricultural University, Ludhiana (PAU) for the period of 2010-2014. The method of data collection was the data extraction through citation analysis. Citations have been noted from the reference sections of each of the thesis on a standard size cards i.e. 5"x3" and collected data was arranged by using the MS-Excel worksheets. Analysis and interpretation has been carried out with the help of tables and graphs.

**7.0 Data Analysis and Interpretation****Table-1 Citations Counts According to Bibliographic Forms**

Bibliographic Form	CCSHAU				PAU			
	No. of Citation	% of Citation	Cumulative Citations	% of cumulative citation	No. of Citations	% of citations	Cumulative Citations	% of cumulative citations
Journals	1063	69.70	1063	69.70	816	77.64	816	77.64
Books Text/Ref.	80	5.24	1143	74.95	30	2.85	846	80.49
Conference Pro/Seminar	158	10.36	1301	85.31	86	8.18	932	88.67
Thesis & Dissertation	53	3.47	1354	88.78	20	1.90	952	90.58
Govt/Inst. Publication	97	6.36	1451	95.14	24	2.28	976	92.86
Bulletin Technical/Research	7	0.45	1458	95.60	12	1.14	988	94.00
Reports/Ann/Tech.	17	1.11	1475	96.72	21	1.99	1009	96.00
News Letters	4	0.26	1479	96.98	7	0.66	1016	96.66
Manual	2	0.13	1481	97.11	5	0.47	1021	97.14
Websites	18	1.18	1499	98.29	6	0.57	1027	97.71
Reference Sources	2	0.13	1501	98.42	1	0.09	1028	97.81
Others	8	0.52	1509	98.95	17	1.61	1045	99.42
Not Identified	16	1.04	1525	100.00	6	0.57	1051	100.00
Total	1525	100.00	1525	100.00	1051	100.0	1051	100.00

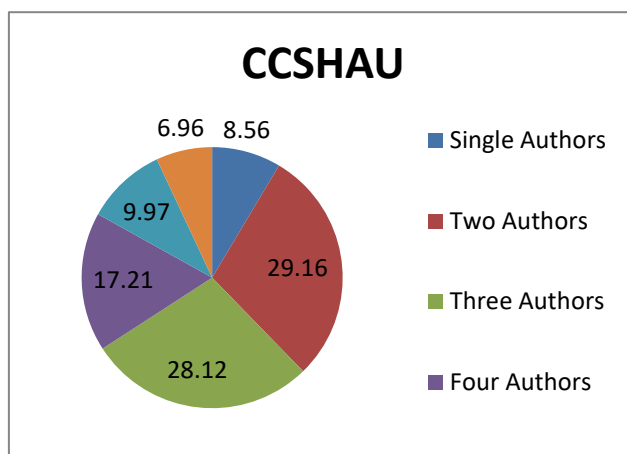


**Fig. 1 Bibliographic Forms**

Table-1 and Fig.1 reveals that Journals are the most cited sources of information preferred by the agricultural scientists of CCSHAU and PAU followed by Conference/Seminar Proceedings and Books. Journals accounts the highest i.e.1063 (69.70%) and 816(77.64%) at CCSHAU and PAU .Conference/Seminar Proceedings have 158(10.36%) and 86(8.18%) of the citations followed by the Books with 80(5.24%) and 30(2.85%) citations in the subject of Agronomy in both the agricultural universities of North India. Manuals and the Reference Sources (Atlas, Digest, Yearbook, Handbook etc.) are the least cited sources of information at both the universities, with only 2(0.13%) and 2(0.13%) at CCSHAU and 5(0.47%) and 1(0.09%) of the citations at PAU. The study clearly shows that Journals, Conference/Seminar Proceedings and Books are the most widely source of information in the field of Agronomy used by the agricultural scientists of CCSHAU, which is maximum as compare to the PAU.

**Table-2 Authorship Pattern of Journals**

Authors	CCSHAU		PAU	
	No. of Citations	% of citations	No. of Citations	% of Citations
Single Authors	91	8.56	84	10.29
Two Authors	310	29.16	263	32.23
Three Authors	299	28.12	250	30.63
Four Authors	183	17.21	119	14.58
Five Authors	106	9.97	51	6.25
More than five authors	74	6.96	49	6.00
Total	1063	100.00	816	100.00



**Fig. 2 Authorship Pattern**

Table-2 and Fig. II shows the authorship pattern of journal citations in both the universities. It reveals that out of the cited journals in the subject of Agronomy, 1063 and 816 journal citations were cited by the agricultural scientists of CCSHAU and PAU respectively. Two authors contributions with 310(29.16%) were cited by the majority of the scientists of CCSHAU as compared to PAU with 263(32.23%).

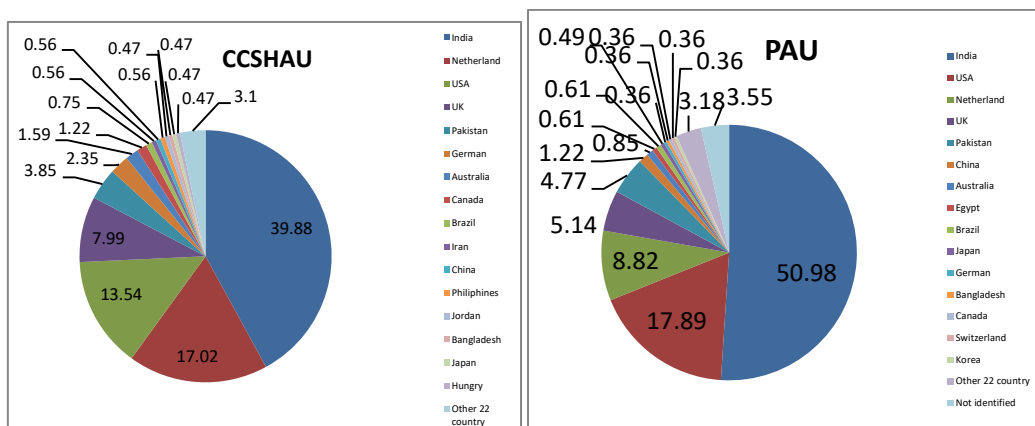
**Table-3 Chronological Distribution of Cited Journals**

Age of Citations	CCSHAU				PAU			
	No. of Citation	% of Citation	Cumulative Citations	% of cumulative citation	No. of Citations	% of citations	Cumulative Citations	% of cumulative citations
0-5	96	9.03	96	9.03	70	8.57	70	8.57
6-10	262	24.64	358	33.67	179	21.93	249	3.51
11-15	269	25.30	627	58.98	190	23.28	439	53.79
16-20	168	15.71	794	74.69	103	12.62	542	66.42
21-25	106	9.97	900	84.66	129	15.80	671	82.23
26-30	51	4.79	951	89.46	57	6.98	728	89.21
31-35	37	3.48	988	92.94	32	3.92	760	93.13
36-40	25	2.35	1013	95.29	13	1.59	773	94.73
41-45	5	0.47	1018	95.76	16	1.96	789	96.69
46-50	9	0.84	1027	96.61	9	1.10	798	97.79
51-55	5	0.47	1032	97.08	3	0.36	801	98.16
56-60	10	0.94	1042	98.02	7	0.85	808	99.00
61 and above	21	1.97	1063	100.00	8	0.98	816	100.00
Total	1063	100.00	1063	100.00	816	100.00	816	100.00

Table-3 indicates the chronological distribution of the cited journals. It clearly reveals that more than 60 years old journals have been preferred by the agricultural scientists in the field of Agronomy which shows their current approach towards the usage of these journals. More than 50% of the articles in both the universities are 15 years old. CCSHAU with 269(25.30%) citations and PAU with 190(23.28%) citations ranges between 0-15 years. Minimum number of journal citations belongs to the year of 41-45 i.e. 5(0.47%) at CCSHAU and 51-55 i.e.3 (0.36) at PAU.

**Table-4 Country- Wise Distribution of Cited Journals**

Country	CCSHAU				PAU				
	No. of Cit.	% of Cit.	Cum. Cit.	% of Cum. Cit.	No. of Cit.	% of Cit.	Cum. Cit.	% of Cum. Cit.	
India	424	39.88	424	39.88	India	416	50.98	416	50.98
Netherland	181	17.02	605	56.91	USA	146	17.89	562	68.87
USA	144	13.54	749	70.46	Netherland	72	8.82	634	77.69
UK	85	7.99	834	78.45	UK	42	5.14	676	82.84
Pakistan	41	3.85	875	82.31	Pakistan	39	4.77	715	87.62
German	25	2.35	900	84.66	China	10	1.22	725	88.84
Australia	17	1.59	917	86.26	Australia	7	0.85	732	89.70
Canada	13	1.22	930	87.48	Egypt	5	0.61	737	90.31
Brazil	8	0.75	938	88.24	Brazil	5	0.61	742	90.93
Iran	6	0.56	944	88.80	Japan	4	0.49	746	91.42
China	6	0.56	950	89.36	German	3	0.36	749	91.78
Philiphines	6	0.56	956	89.93	Bangladesh	3	0.36	752	92.15
Jordan	5	0.47	961	90.40	Canada	3	0.36	755	92.52
Bangladesh	5	0.47	966	90.87	Switzerland	3	0.36	758	92.89
Japan	5	0.47	971	91.34	Korea	3	0.36	761	93.25
Hungry	5	0.47	976	91.87					
Other 22 country	33	3.10	1009	94.92	Other 22 country	26	3.18	787	96.44
Not Identified	54	5.07	1063	100.00	Not identified	29	3.55	816	100.00
Total	1063	100.00	1063	100.0	Total	816	100.00	816	100.00



**Fig. 4 Country-wise Distribution**

Table-4 and Fig. IV, clearly indicates that maximum articles with 424(39.88%) were contributed from India in the subject of Agronomy at CCSHAU, followed by Netherlands with 181(17.02%) and USA with 144(13.54%) articles, respectively. Whereas at PAU, 416(50.98%) articles were contributed from India, which is less as compared to CCSHAU, followed by USA and Netherlands with 146(17.89%) and 72(8.82%) articles respectively and Bangladesh got the last position as Germany, Canada, Korea, Jordan, Japan etc. It was observed that (82.66%) and (87.62%) articles of the total were contributed altogether from India, USA, Netherlands, UK and Pakistan, which is maximum at PAU as compared to the CCSHAU in the field of Agronomy.

**Table-5(a) Ranking of Cited Journals in Agronomy (CCSHAU)**

Sr. No.	Title of Journal	Rank	No. of Citations	% of Citations	Cumulative Citations	% of Cumulative Citations
1	Indian Journal of Weed Science	1	99	9.31	99	9.31
2	Indian Journal of Agronomy	2	96	9.03	195	18.34
3	Soil Tillage Research	3	75	7.05	270	25.39
4	Agronomy Journal	4	45	4.23	315	29.63
5	Indian Journal of Agricultural Science	5	42	3.95	357	33.58
6	Field Crop Research	6	33	3.10	390	36.68
7	Soil Science Society of American Journal	7	26	2.44	416	39.13
8	Haryana Journal of Agronomy	8	21	1.97	437	41.11
9	Environment and Ecology	9	20	1.88	457	42.99
10	Plant and Soil	10	18	1.69	475	44.68
11	Nutrient Cycling of Agro Ecosystem	11	13	1.22	488	45.90
12	Crop Research	12	11	1.03	499	46.94
13	Karnataka Journal of Agricultural Science	13	10	0.94	509	47.88
14	Current Science	13	10	0.94	519	48.82
15	Agriculture Water Management	13	10	0.94	529	49.76
16	Indian Journal of Plant Physiology	14	9	0.84	538	50.61
17	Pesticides	14	9	0.84	547	51.45
18	Advances in Agronomy	15	8	0.75	555	52.21
19	Asian Journal of Plant Science	15	8	0.75	563	52.96
20	Biology and Fertility of Soil	15	8	0.75	571	53.71
21	Weed Technology	16	7	0.65	578	54.37
22	Journal of Agricultural Science	16	7	0.65	585	55.03
23	Soil Biology & Biochemistry	16	7	0.65	592	55.69
24	Journal of Experimental Botany	16	7	0.65	599	56.34
25	HAU Journal of Research	17	6	0.56	605	56.91
26	New Phytologist	17	6	0.56	611	57.47
27	Weed Research	17	6	0.56	617	58.04
28	Canadian Journal of Soil Science	17	6	0.56	623	58.60
29	Tropical Pest Management	18	5	0.47	628	59.07
30	Madras Agricultural Journal	18	5	0.47	633	59.54
31	Journal of Research P.A.U.	18	5	0.47	638	60.01
32	Annals of Agricultural Research	18	5	0.47	643	60.48
33	Annals of Botany	18	5	0.47	648	60.95
34	Crop Protection	18	5	0.47	653	61.42
35	European Journal of Agronomy	18	5	0.47	658	61.90

36	International Journal of Agronomy	18	5	0.47	663	62.37
37	Irrigation Science	18	5	0.47	668	62.84
38	Cereal Research Communication	18	5	0.47	673	63.61
39	Others (234 Journals)		390	36.68	1063	100.00

**Table-5(b) Ranking of Cited Journals in Agronomy (PAU)**

Sr. No.		Rank	No. of Citation	%age of Citation	Cumulative Citation	% of Cumulative Citations
1	Indian Journal of Weed Science	1	101	12.37	101	12.37
2	Indian Journal of Agronomy	2	97	11.88	198	24.26
3	Agronomy Journal	3	44	5.39	242	29.65
4	Indian Journal of Agricultural Science	4	41	5.02	283	34.68
5	Field Crop Research	5	39	4.77	322	39.46
6	Crop Science	6	27	3.30	349	42.76
7	Journal of Cotton Research & Development	7	21	2.57	370	45.34
8	Indian Sugar	8	16	1.96	386	47.30
9	Madras Agriculture Journal	9	15	1.83	401	49.14
10	Crop Protection	10	12	1.47	413	50.61
11	Advances in Agronomy	11	11	1.34	424	51.96
12	Soil Tillage Research	12	10	1.22	434	53.18
13	Karnataka Journal of Agricultural	12	10	1.22	444	54.41
14	Journal of Research P.A.U	13	8	0.98	452	55.39
15	Annals of Agricultural Research	13	8	0.98	460	56.37
16	Cotton Development	13	8	0.98	468	57.37
17	Weed Science	14	7	0.85	475	58.21
18	Current Science	14	7	0.85	482	59.06
19	Weed Technology	15	6	0.73	488	59.80
20	Int. Journal of Agricultural & Biology	15	6	0.73	494	60.53
21	Cooperative Sugar	15	6	0.73	500	61.27
22	Sarhad Journal of Agriculture	16	5	0.61	505	61.88
23	Weed Research	16	5	0.61	510	62.50
24	Pakistan Journal of Biological Science	16	5	0.61	515	63.11
25	Oryza	16	5	0.61	520	63.72
26	Journal of Agronomy & Crop Science	16	5	0.61	525	64.33
27	Journal of Maharashtra Agri. Univ.	16	5	0.61	530	64.95
28	Journal of Cotton Science	16	5	0.61	535	65.56
29	Agriculture Water Management	16	5	0.61	540	66.17
30	Pakistan Sugar Journal	16	5	0.61	545	66.78
31	European Journal of Agronomy	16	5	0.61	550	67.40
32	5 Journals cited 4 times	17	20	2.45	570	69.85
33	19 Journals cited 3 times	18	57	6.98	627	76.83
34	32 Journals cited 2 time	19	64	7.84	691	84.68
35	25 Journals cited 1 time	20	125	15.3	816	100.00

Table-5(a) and 5(b) shows the ranked list of the most cited journals in the field of Agronomy. It is found that the agricultural scientists have cited a total of 1063 journals in CCSHAU and 816 journals in PAU. Indian Journal of Weed Science occupies the first rank with 99(9.31%) and 101 (12.37%) of the cited journals in both the agricultural universities i.e. CCSHAU and PAU, followed by the Indian Journal of Agronomy with 96(9.03%) and 97(11.88%) of the total cited journals in CCSHAU and PAU. The first 5 journals covers (33.58) of the total cited journals in CCSHAU whereas in PAU, the first 4 journals covers (34.68%) citations of the total cited journals.



**Table 6- Scattering of Journals and citations over Bradford’s Zone in Agro**

Zone	CCSHAU				PAU			
	No. of Journals	% of Journals	No. of Citations	% of Citations	No. of Journals	% of Journals	No. of Citations	% of Citations
1	5	1.83	357	33.58	4	1.88	283	34.68
2	38	13.97	316	29.72	26	12.26	262	32.10
3	234	80.02	390	36.68	182	85.84	271	33.21

It is clear from the above table no. 6 that in CCSHAU, the first 5 journals cover 357 articles, next 38 journals cover 316 articles and the last 234 journals cover 390 articles. In other words, approximately one-third of the total citations have been covered by each group of journals. According to the Bradford Law:  $3 = n$  then  $1: n : n^2$

$$5:38:234 = 5: 5 \times 3: 5 \times 9^2$$

$$= 5: 15:405$$

This doesn’t fit well into the Bradford’s distribution whereas in PAU, the first 4 journals cover 283 articles, next 26 journals cover 262 articles and the last 182 journals covers 271 articles only. The Bradford Law of Scattering also doesn’t fit well into the distribution, for example:-

$$4: 26: 182 = 4: 4 \times 3: 4 \times 9^2$$

$$= 4: 12: 324$$

It has been found that in both the Agricultural Universities of North India i.e. CCSHAU and PAU, the Bradford’s Law of Scattering does not suit well into the distribution of the journals.

**8.0 Findings**

The major findings of the present study are as under:

- Agricultural Scientists are mainly using journal articles with 1063(69.93%) citations in CCSHAU and 816(77.64%) citations in PAU.
- Two authored articles with 310(29.16%) in CCSHAU and 263(32.23%) citations in PAU dominated the authorship pattern for journals, followed by three authors i.e.299 (28.12%) in CCSHAU and 250(30.63%) citations in PAU.
- Majority of the agricultural scientists cited the latest journals i.e.269 (25.30%) in CCSHAU and 190(23.28%) in PAU published in the years ranging from 2000-2004.
- The most of the journals cited by the agricultural scientists of CCSHAU were from India with 424(39.88%) followed by Netherlands with 181(17.02%) and India with 416(50.98%) citations topped the list, followed by USA with 416(17.89%) in PAU.
- Citations of journals, *Indian Journal of Weed Science* occupied the first rank with 99(9.31%) citations in CCSHAU and 101(12.37%) citations in PAU, followed by *Indian Journal of Agronomy* with 96(9.03%) and 97(11.88%) in both the universities of North India
- Bradford’s law does not fit well in the journals cited in the field of Agronomy both at PAU and CSKHPKV.

**9.0 Conclusion**

In a nutshell, it can be concluded that the agricultural scientists are consulting different sources of information for their research works but Journals are their first choice, followed by the Conference/Seminar Proceedings and Books. Two authored articles dominate the authorship pattern of the cited journals at both the Universities. *Indian Journal of Weed Science* has been ranked first in the list of core journals. Near about 50% of the articles in both the universities are 15 years old. The study also revealed that (82.66%) and (87.62%) articles of the total were contributed altogether from India, USA, Netherlands, UK and Pakistan.

**10.0 References**

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