

World Research Publications on Potato (*Solanum Tuberosum*): A Scientometric Assessment

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Abstract - This paper attempts to analyze quantitatively the growth and development of Potato (*Solanum tuberosum*) vegetable crop research in India in publication output as reflected in CAB Direct Online Database. During the period 1939-2017 a total of 1,27,234 papers were published by the scientists of global respectively on Potato Crop analysis. India is the top country in Agricultural research with its contribution of 7,258 papers which is nearly (7.66%) of the global research output of Agricultural research followed by the specific country are in USA with 7,056 papers (7.45%). The most preferred journals where the American Potato Journal with 1,784 papers (1.88%) followed by the Potato Research with 1,764 papers (1.86%). The study revealed that out of the world, India has the highest range the production of Potato. It covers India is a top level in the field of agricultural research as a part of the Indian country are ranked higher position of Uttar Pradesh in a northern region.

Keywords: Potato Crop, *Solanum tuberosum*, Scientometric, CAB Direct, Agricultural Crop, Time Series Analysis

I. INTRODUCTION

Potato (*Solanum tuberosum*) is viewed as one of the principle sustenance items worldwide and It is the world's fourth biggest nourishment trim and have been scattered from their cause in South American to numerous nations around the globe [1]. What's more, these tubers speak to a staple product in numerous nations around the globe today. Potatoes are developed in roughly 80 % everything being equal, now the most vital non-grain edit, and the fourth most vital nourishment in general on the planet, with a yearly creation of around 300 million tons. Potatoes shape one of the major rural products on the planet, and are expended day by a great many individuals from assorted social foundations.

II. OBJECTIVES OF THE STUDY

The main objective of this study is to research, the analysis output in Potato (*Solanum tuberosum*) vegetable crop analysis, as reflected in its publication output throughout 1939-2017 in CAB Direct Online database. In exacting, the study focuses on the subsequent objectives:

1. To examine the time series analysis of overall research output of Potato vegetable crop analysis supported CAB Direct Online database for the period 1939-2017.

2. To examine the share of Indian contribution and identify the top ranking country within the field of Potato Crop analysis.
3. To study the highest 10 journals publishing more research papers on Potato Crop analysis.
4. To identify the types of publications.
5. To identify the highest 10 authors within the field of Potato Crop analysis.
6. To identify the language distribution of Potato Crop analysis.

III. METHODOLOGY

The Study is based on the publication data in the field of Potato Crop analysis, retrieved from the CAB Direct Online database for 78 years (1939-2017). The process used in the key word, selection was as followed 'Potato' in the article title and published between 1939-2017.

IV. RESULTS AND DISCUSSION

A. Growth of Publications

The Potato Crop data collected through the CAB Direct Online database has been analyzed and presented. For the presentation of data, different kinds of statistical tools such as tables and diagrams are used.

B. Year of Publication on Potato Crop Literature

The predicted value of literature output for the year 2020 is 4128.26 and the predicted literature output for the year 2049 is 5926.84. With the application of the formula, the time series analysis and subsequently, from the results obtained for the years 2020 and 2049, it is found that the future trend of growth of research article in Potato crop analysis research output may take an increasing trend for the years to come [6].

The inferences from the calculations proved that there is a positive growth at the India in research literature output in Potato. It is evident from the above discussion that the time series analysis of potato literature publication has shown in the table I.

TABLE I TIME SERIES ANALYSIS OF POTATO LITERATURE PUBLICATION

Year	Article (Y)	X	X ²	X*Y	Trend Value
1939	1	-31	961	-31	97
1940	1	-30	900	-30	159
1942	1	-29	841	-29	221
1953	1	-28	784	-28	283
1955	4	-27	729	-108	345
1957	4	-26	676	-104	407
1960	1	-25	625	-25	469
1962	1	-24	576	-24	531
1963	2	-23	529	-46	593
1964	12	-22	484	-264	655
1965	5	-21	441	-105	717
1966	7	-20	400	-140	779
1967	14	-19	361	-266	841
1968	23	-18	324	-414	903
1969	70	-17	289	-1190	965
1970	241	-16	256	-3856	1027
1971	757	-15	225	-11355	1089
1972	1827	-14	196	-25578	1151
1973	2178	-13	169	-28314	1213
1974	2278	-12	144	-27336	1275
1975	2529	-11	121	-27819	1337
1976	2815	-10	100	-28150	1399
1977	2584	-9	81	-23256	1461
1978	2776	-8	64	-22208	1523
1979	2506	-7	49	-17542	1585
1980	2460	-6	36	-14760	1647
1981	2177	-5	25	-10885	1709
1982	2272	-4	16	-9088	1771
1983	2475	-3	9	-7425	1833
1984	2402	-2	4	-4804	1895
1985	2299	-1	1	-2299	1958
1986	2192	0	0	0	2020
1987	2345	1	1	2345	2083
1988	2625	2	4	5250	2146
1989	2444	3	9	7332	2209
1990	2564	4	16	10256	10319
1991	2512	5	25	12560	10382
1992	2487	6	36	14922	10445
1993	2320	7	49	16240	10508
1994	2438	8	64	19504	10571
1995	2438	9	81	21942	10634
1996	2453	10	100	24530	10697

1997	2550	11	121	28050	10760
1998	2596	12	144	31152	10823
1999	2607	13	169	33891	10886
2000	2615	14	196	36610	10949
2001	2709	15	225	40635	11012
2002	2924	16	256	46784	11075
2003	2887	17	289	49079	11138
2004	2938	18	324	52884	11201
2005	2971	19	361	56449	11264
2006	2600	20	400	52000	11327
2007	3344	21	441	70224	11390
2008	3211	22	484	70642	11453
2009	3283	23	529	75509	11516
2010	3465	24	576	83160	11579
2011	3375	25	625	84375	11642
2012	3889	26	676	101114	11705
2013	3786	27	729	102222	11768
2014	3751	28	784	105028	11831
2015	3792	29	841	109968	11894
2016	3482	30	900	104460	11957
2017	2918	31	961	90458	12020
2020		34			
2049		63			
	127234	0	20832	1292096	

$$Y_c = a + bx$$

$$a = \sum_{j=1}^N / N = 127234 / 63 = 2019.58$$

$$b = \sum x_j y_j / \sum x_j^2 = 1292096 / 20832 = 62.02$$

Estimated literature in 2020 is when X= 2020-1986=34
= 2019.58 + 62.02 x 34= 4128.26

Estimated literature in 2025 is when X=2049-1986=63
=2019.58 + 62.02 x 63 = 5926.84

C. Rank-Wise Indian States Distribution of Publications

The study reveals that India is the top country in Agricultural research with its contribution of 94,658 papers which is nearly (31.04%) of the global research output of Agricultural research followed by the specific country are in India with 7,258 papers (7.66%), USA ranks second position with 7,056 papers (7.45%) and USSR is a third position with 6,872 papers (7.25%).

It covers India is a top level in the field of Agricultural research, Uttar Pradesh, Northern States are ranked first place in India and it covers 70% of agricultural lands in India [8] so that mainly concentrate on agriculture orientation. The top 10 Country based on number of publications is furnished in Table II.

TABLE II RANKING COUNTRY IN INDIA OF POTATO ANALYSIS

Name of the States	No. of Publications	Percentage	Rank
India	7258	7.66	1
USA	7056	7.45	2
USSR	6872	7.25	3
UK	4151	4.38	4
Poland	4035	4.26	5
Germany	3660	3.86	6
South Africa	3236	3.41	7
China	2998	3.16	8
Canada	2081	2.19	9
Netherlands	1972	2.08	10

D. Preferred Journals

The most popular journals by the scientists concerned with the Potato Crop analysis were: American Potato Journal with 1784 papers (1.88%) followed by the Potato Research with 1764 papers (1.86%). The study revealed that out of high five most popular journals by the Potato Crop researchers [3], three journals viz., Acta Horticulturae 1655 papers (1.74%) and Plant Disease 1512 papers (1.59%), American Journal of Potato Research 1012 papers (1.06%) and particularly India has published a Journal of the Indian Potato Association is a ninth place 741 papers (0.78%) of ranking which indicates that the contribution of India in Potato Crop analysis is major role it indicates the ranking first position of Uttar Pradesh. The highest 10 most popular journals are listed in Table III with the amount of papers revealed.

TABLE III PREFERRED JOURNALS BY POTATO CROP ANALYSIS

S.No.	Journal Name	No. of Papers	Percentage
1.	American Potato Journal	1784	1.88
2.	Potato Research	1764	1.86
3.	Actga Horticulturae	1655	1.74
4.	Plant Disease	1512	1.59
5.	American Journal of Potato Research	1012	1.06
6.	Phytopathology	959	1.01
7.	Kartoffelbau	925	0.97
8.	Journal of Agricultural and Food Chemistry	816	0.86
9.	Journal of the Indian Potato Association	741	0.78
10.	Annals of Applied Biology	695	0.73

E. Leading Format of Publication

The study reveals that the main source of publications coated by "the CAB" Direct Online database for Potato Crop analysis is journal articles with 1,09,168 papers

(79.95%) followed by conference papers with 13,791 papers (10.10%). Miscellaneous third position with 6,380 (4.67%), Book Chapter and Abstract only are within the fourth and fifth places with 3,022 (2.21%) and 1,798 (1.31%) various. The highest 10 varieties of publications are furnished in Table IV.

TABLE IV LEADING FORMAT OF PUBLICATION

S.No.	Kinds of Document	No. of Papers	Percentage
1.	Journal article	109168	79.95
2.	Conference paper	13791	10.10
3.	Miscellaneous	6380	4.67
4.	Book chapter	3022	2.21
5.	Abstract only	1798	1.31
6.	Annual report	1347	0.98
7.	Bulletin article	590	0.43
8.	Thesis	325	0.23
9.	Patent	66	0.04
10.	Standard	52	0.03

F. Most Productive Authors

The study reveals that Pandey, S.K is that the most ranking authors of Potato Crop analysis who revealed 559 papers (4.06%) followed by Khurana, S.M.P with 515 papers (3.74%). It's observed that out of the highest five authors who contributed a lot of papers in Potato Crop analysis, there are world ranking authors contributed a paper level of 381 to 197 viz., Singh, B.P 381 papers (2.77%), Shekhawat, G.S 315 papers (2.29%) , and Struik, P.C 283 Papers (2.05%). Table – 5 lists the highest 10 ranking authors within the field of Potato Crop analysis.

TABLE V MOST PRODUCTIVE AUTHORS IN POTATO CROP ANALYSIS

S. No.	Name of Author	No. of Papers	Percentage
1.	Pandey, S.K	559	4.06
2.	Khurana, S.M.P	515	3.74
3.	Singh, B.P	381	2.77
4.	Shekhawat, G.S	315	2.29
5.	Struik, P.C	283	2.05
6.	Haverkort, A.J	246	1.79
7.	Kumar, S	238	1.73
8.	Schepers, H.T.A.M	227	1.65
9.	Visser, R.G.F	205	1.49
10.	Singh, R.P	197	1.43

G. Language Distribution

It is observed that English is the most predominant language used by the researchers for communication in the Potato Crop analysis with 86,905 papers (67.92%) followed by

Russian with 8,258 (6.45) and German with 5580 (4.36%). The top 5 predominant languages are furnished in Table VI.

TABLE VI LANGUAGE DISTRIBUTION OF POTATO ANALYSIS

S.No.	Language	No. of Papers	Percentage
1.	English	86905	67.92
2.	Russian	8258	6.45
3.	German	5580	4.36
4.	Chinese	4735	3.70
5.	Polish	4084	3.19

V. FINDINGS

These are the findings of the Scientometric study and it is hoped this finding is likely to be helpful for the stakeholders of Potato Crop analysis knowledge managers in these areas:

1. Indian contribution to global Agricultural research based on the “CAB” Direct Online database revealed that India has published 7,258 papers in various fields of Potato Crop analysis.
2. Pandey, S.K is that the most ranking authors of Potato Crop analysis who revealed 559 papers (4.06%) followed by Khurana, S.M.P with 515 papers (3.74%).
3. Most preferred journals are: American Potato Journal with 1784 papers (1.88%) followed by the Potato Research with 1,764 papers (1.86%).
4. Journal article viz., with 1,09,168 papers (79.95%) followed by conference papers with 13,791 papers (10.10%). Miscellaneous third position with 6,380 (4.67%), Book Chapter and Bulletin Article are within the fourth and fifth places with 3,022 (2.21%) and 1,798 (1.31%) of ranking which “clearly” indicates that the contribution of India in Potato Crop analysis is major role.
5. India is the top country in Agricultural research with its contribution of 94,658 papers which is nearly (31.04%) of the global research output of Agricultural research followed by the specific country are in India with 7,258 papers (7.66%), USA ranks second position with 7,056 papers (7.45%) and USSR is a third position with 6,872 papers (7.25%).

VI. CONCLUSION

During sixty-six long periods of time traverse worldwide commitment regarding distributions is essentially expanded in the field of Potato (*Solanum tuberosum*) vegetable product research [6]. Time series analysis additionally demonstrates that the positive development drift in the future. The India finish the primary spot with most extreme 7.66% distributions and it covers India is the best level in the field of Agricultural research, Uttar Pradesh, Northern States are positioned in front of the rest of the competition [4] in India and it covers 70% of rural grounds in India so chiefly focus on horticulture introduction. An Indian specialist should be the Potato trim field so the commitment of India in this examination zone could be essentially expanded.

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