KNOWLEDGE SHARING IN RICE RESEARCH. 3. CITATION ANALYSIS OF IRRI SCIENTISTS' LITERATURE OUTPUT, 2000-2004

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INTRODUCTION

A research organization, like the International Rice Research Institute, is committed to disseminate research results through scholarly communication and information sharing. One traditional option open to scientists is the publication of research papers in scientific journals. Since the start of its operations in 1960, IRRI scientists have generated voluminous research results and have promptly published these in books, diverse periodicals or conference proceedings. The information published in these information sources serve as the foundation for the discovery of new knowledge by other researchers. Awareness of the impact or how far the literature output of IRRI scientists have been used by other researchers would be useful, not only to the authors, but to the Institute as well.

Citation analysis is considered as "an important tool used to trace scholarly research, measure impact, and justify tenure and funding decisions" (Bauer, 2005). In many instances citation analysis data are also used "to rank universities, departments, even countries" (Perkel, 2005). It is also possible to use citation counts to

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rank and measure the achievement of individual scientists, as when they are nominated for awards.

Until 2004, ***Web of Science[1] (WOS)***has monopolized the realm of citation tracking or measuring how often journal articles are cited by others. Changes in scholarly communication, as evident in digital Internet scientific sources, preprint/postprint servers, and open access e-journals, offer new options to scientists, hence citation tracking is no longer monopolized by ***WOS.*** In late 2004, ***Scopus[2](SCO)*** was launched by Elsevier as an indexing and citation database of articles from journals in science and social sciences fields. ***SCO*** indexes more journals (15,000) than ***WOS*** (8,900), and covers more open access and international journals. But the depth of coverage by ***WOS*** is not present in ***SCO***. The former covers scientific literature from 1975 onwards, while the latter starts from 1996.

Google Scholar(GS) at **http://scholar.google.com/,** is another citation tracking instrument whose Beta version was launched by Google in November 2004**.** ***GS*** is freely available and also records citations of peer-reviewed literature as well as conference proceedings, dissertations, pre- and postprint servers, and other nontraditional media. The scholarly content of ***GS***, however, is not comparable with ***WOS*** and ***SCO*** as shown by the huge volume of literature picked up by ***GS***, which evidently has more of quantity than scholarly content. However, the non-journal content of ***GS*** makes it at par with the other two (Jacso, 2004).

At the time this study was conducted, IRRI staff had access to all three. The LDS subscribed to ***WOS*** in 2005 and 2006. However, access to ***WOS*** ceased on April 1, as subscription was not renewed in 2007 due to budget constraints. ***SCO*** was available on a free trial basis, from December 2006 up to March, 2007, as

[1]Web of Science is a product of ISI. "The *Science Citation Index* (SCI®) provides access to current and retrospective bibliographic information, author abstracts, and cited references found in the world's leading scholarly science and technical journals covering more than 150 disciplines". http://portal.isiknowledge.com/

[2]Scopus claims to be the "largest abstracting and citation database of research literature and quality web researches"
http://www.scopus.com/scopus/home.url

arranged by the FAO Library for the CGIAR LIS Consortium. ***GS*** is freely available on the WWW.

This paper aims to look at scholarly works of IRRI scientists published in journals and to determine which among the scholarly works of IRRI scientists have the most impact based on frequency of usage by other scientists and to fully utilize the limited period of availability of the two databases: ***SCO*** and ***WOS***. This study also reveals which journal titles are selected by IRRI scientists in publishing their research results. In some way, this will also help the librarians in the selection process, i.e. to determine journal titles for subscription. The scientists, on the other hand, will become aware of the pattern of selection of journals where they will submit their works for publication. This study continues a similar work conducted by the IRRI LDS in 2005 (Ramos, 2005) and which covered IRRI publications from 1998 up to 2002.

METHODOLOGY

Taking advantage of the limited period of availability of ***SCO*** and ***WOS***, the IRRI Library staff conducted citation tracking of IRRI scientists' journal articles covering the years 2000 up to 2004. This activity progressed from February up to late March 2007. The 5-year period covered was selected as 3 to 5 years is deemed to represent the optimum period when a paper is used as vehicle for scholarly communication and they constitute the main form generally covered by the bibliometric instruments used in the study.

Lists of IRRI publications were gathered from the annual IRRI Director General's Report and from the database of the Deputy Director General for Program Planning and Coordination (DPPC). There are 5 librarians in the LDS and each was assigned to do citation searching for one annual listing. One Library Associate did part of the tracking of the 2003 list due to the health problem of one librarian. The following table gives the respective assignments of the library staff involved in the project:.

Table 1. Citation Tracking Per IRRI Library Staff

Year of Publication	Total Number of Journal Articles	Staff Assigned
2000	162	Mila Ramos
2001	86	Carmelita Austria
2002	140	Lea Delos Reyes
2003	124	Emerald Lansangan Ma Consuelo Parducho
2004	193	Reagan Austria
Total	705	

Manual counting of journal titles, where IRRI papers appeared, was also done by each.

The lists of journal articles written by IRRI Scientists and those gathered from the Director General's Report are incomplete. Additional citations came up while using various databases, including the online database of DPPC.

RESULTS AND DISCUSSION

Total Output

From year 2000 up to 2004, IRRI scientists shared rice and rice-related information through 705 articles published in 224 journals. This figure is higher than the total number, 589, gathered in an earlier study of IRRI journal articles published in a 5-year period, i.e. from 1998-2002 (Ramos, 2005). There is close to 50% drop in the number of articles between 2000 and 2001. This might be attributed to the staff reduction program implemented in 1998.

Although the Division which contributed the paper is indicated in the tables, no attempt was made to collate the data by division as most of the papers are collaborative works between 2 or more Divisions. For some papers, it is difficult to tell which Division they originated from, hence many cells lack this kind of information.

IRRI journal articles were cited 6,981 times by other scientists, worldwide.

Table 2. Journal Articles Published by IRRI Scientists 2000-2004

Year of Publication	Number of Journal Articles	Number of Citations
2000	162	2142
2001	86	1110
2002	140	1247
2003	124	1981
2004	193	501
Total	705	6981

Usage/Citation of IRRI Journal Articles

Table 3 gives a breakdown of citations per year**.** It is not fair to say that papers with zero citation are not useful at all as many of these were published in national journals, access to which is quite limited. Also, some of them are written in foreign languages like Chinese or Japanese, which can be used only by scientists who can read them.

Table 3. Number of Journal Articles and Rate of Citations Per year

Year of Publication	Total	Number of articles with their respective number of citations						Total Citations Per Year
		50 and more	30-49	20-29	10-19	1-9	0	
2000	162	5	15	16	31	50	46	2142
2001	86	5	14	10	42	31	12	1110
2002	140	1	7	13	25	53	37	1247
2003	124		5	6	28	51	34	1981
2005	193		1	4	27	82	99	501
Totals	705	11	42	49	153	267	228	

Highly Cited Papers

There are 11 articles with 50 or more citations. It is expected that the newer publications have less usage than the older ones. Hence, those published in 2000 were cited more than the later publications. The table shows that citation frequency is also a function of age, although this does not hold true in some cases. For example the fourth-ranked paper was published in 2002 but it has been used more often than its earlier counterparts. Also, the top paper in this study was also the top paper in 2005 although the coverage then started with articles published from 1998.

Table 4. Top 11 highly Cited Papers (50 or more citations), 2000-2004

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
1. Zhu, Y.Y., Chen, H., Fan, J.H., Wang, Y.Y., Li, Y., Chen, J.B., et al. (2000). Genetic diversity and disease control in rice. *Nature, 406*, 718-722.	EPPD	121	131	243	243

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
2. Joshi, S.P., Gupta, V.S., Aggarwal, R.K., Renjekar, P.K., & Brar, D.S. (2000). Genetic diversity and phylo-genetic relationship as revealed by inter simple sequence repeat (ISSR) polymorphism in the genus Oryza. *Theoretical and Applied Genetics, 100*, 1311-1320.	PBGB	58	68	109	109
3. Tu, J., Zhang, G., Datta, K., Xu, C., He, Y., Zhang, Q., et al. (2000). Field performance of transgenic elite commercial hybrid rice expressing Bacillus thuringiensis delta-endotoxin. *Nature Biotechnology, 18*, 1101-1104.	PBGB	54	64	95	95
4. Sasaki, A., Ashikari, M., Ueguchi-Tanaka, M., et al. (2002 Apr 18). A mutant gibberllin-synthesis gene in rice. *Nature, 416* (6882), 701-702.	PBGB	49	84	37	84
5. Li, Z.K., Luo, L.J., Mei, H.W., Wang, D.L., Shu, Q.Y., Tabien, R., et al. (2001). Over-dominant epistatic loci are the primary genetic basis of in-breeding depression and heterosis in rice. I. Biomass and grain yield. *Genetics, 158* (4), 1737-1753.	PBGB	55	54	65	65
6. Leach, J.E., Cruz, C.M.V., Bai, J., & Leung, H. (2001). Pathogen fitness penalty as a predictor of durability of disease resistance genes. Annu. Rev. Phytopatho. *39*, 187-224.	EPPD	61	59	63	63
7. Luo, L.J., Li, Z.K., Mei, H.W., Shu, Q.Y., Tabien, R., Zhong,	PBGB	45	61	51	61

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
D.B., et al. (2001). Overdo-minant epistatic loci are the primary genetic basis of inbreeding depression and heterosis in rice. II. Grain yield components. *Genetics, 158*(4), 1755-1711.					
8. Bouman, B.A.M., & Tuong, T.P. (2001). Field water management to save water and increase its producti-vity in irrigated rice. *Agric. Water Manage., 49*(1), 11-30.	CSWS	53	54	58	58
9. Singh, S., Sidhu, J.S., Huang, N., Vikal, Y., Li, Z., Brar, D.S., et al. (2001). Pyramiding three bacterial blight resistance genes (xa5, xa13, and Xa21) using marker-assisted selection into indica ricecultivar PR106. *Theor. Appl.Genet., 102*(6-7), 1011-1015.	PBGB	43	56	42	56
10. Bouman, B.A.M., & Tuong, T.O. (2000). Field water management to save water and increase its produc-tivity in irrigated rice. *Agricultural Water Management, 49*(1), 11-30.	CSWS	53	50	54	54
11. Bai, J.F., Choi, S.H., Ponciano, G., Leung, H., & Leach, J.E. (2000). Xanthomonasoryzae pv. Oryzae avirulence genes contribute differently and specifically to pathogenagressiveness. *Molecular Plant Microbe Interactions, 13*, 1322-1329.	EPPD	49	50	47	50

The most frequently cited paper, with 243 (***GS*** figures), continued to be the one by Zhu, et al. In 2005, it was also on top, with 87 citations, as per data from ***WOS,*** and 97 times according to ***GS***. The second-ranked paper by Joshi, et al., used to occupy 15th position in the previous study, with 40 citations as recorded by ***WOS***. The 3rd-ranked paper is not included in the top 23 papers in the 2005 study as it had less than 30 citations then. Only 4 of the top papers cited are included in the list of highly cited articles in the 2005 study.

There are 228 publications with 0 citations; but this does not mean that these were not used at all. It is possible that the journals where these articles appeared are not included in the list of journals indexed by the 3 citation tracking instruments used here. This is usually the case with national publications, e.g. Philippine Journal of Crop Science, India Grains, Philippine Entomologist, etc.

In the earlier study, there were only 23 papers with 30 or more citations, compared to 29 in the current one. There is no attempt here to quantify the output of each Division because of the merging of some divisions with another and also, most of papers are joint initiatives of 2 or more divisions.

Journal Preferences of IRRI Scientists

Selection of journal titles for publishing their works is the prerogative of every scientist. The results of IRRI researches were shared via 224 diverse journal titles, most of which are peer-reviewed. Table 5 shows the top titles publishing the most number of IRRI papers. Of these, 9 are listed in the Thomson Scientific master list of peer-reviewed journals, which enjoys the reputation of being the elite group of this form of publication. On top of the list is ***Field Crops Research***, with 46 papers. This is also the top title in the 2005 study. It published 53 IRRI papers in 1998-2002 and 29 in 2000-2004.

Breeding Research and ***Philippine Journal of Crop Science,*** although highly selected**,** are not included in the

Thomson-Scientific master list[3]. Also, these usually publish abstracts instead of full papers, hence the frequent occurrence of IRRI works here are in reality abstracts of papers presented in conferences only. If these 2 were not included in the ranking, then ***Breeding Science*** , with 9 papers and ***Molecular Plant-Microbe Interactions*** and ***Biology and Fertility of Soils***, with 8 papers each, would be in the list of top choices.

Two titles in the table, ***Breeding Research*** and ***Plant Production Science,*** are available via open access platforms. All the rest are available via paid licenses or subscriptions.

Table 5. Journal Titles with the Most Number of IRRI Publications

Journal Titles	Impact Factor	Publisher	2000	2001	2002	2003	2004	Total
Field Crops Research	1.241	Elsevier	4	3	17	8	14	46
Breeding Research	No data	Council of Academic Societies, Japan	12	12	9	2	1	36
Theoretical and Applied Genetics	3.063	Springer	5	5	4	12	7	23
Euphytica	0.884	Springer	2	5	3	7	3	20
Agronomy Journal	1.473	American Society of Agronomy	5	4	3	3	3	18
Philippine Journal of Crop Science	No data	Crop Science Society of the Phil.	4		3	5	5	17
Economic and Political Weekly	No data	Sameeksa Trust	7		1	5	1	14

[3]Thomson Scientific Master Journal List at http://www.thomsonscientific.com/cgi-bin/jrnlst/jloptions.cgi?PC=master

Journal Titles	Impact Factor	Publisher	2000	2001	2002	2003	2004	Total
Plant Production Science		Crop Science Society of Japan	7	1		2	4	14
Soil Science Society of America Journal	1.338	Soil Science Society of America	6		3		3	12
Crop Science	0.759	Crop Science Society of America	2		5	2	1	10

The impact factors given in the first column indicate the average number of times a journal's articles are cited over a 3-year period, i.e. the publication year and two years after publication. A journal with a high impact factor means that it is more reputable and authoritative than those that are seldom used. The impact factor data given here were taken from the journal publishers' web sites as sourced from Thomson Scientific, formerly known as ISI[4], except for a few, which were gathered from various WWW sources. Ranking of journals cannot be done as the LDS does not have the latest issue of **Journal Citation Reports[5] (JCR).** The **JCR** is a reputable facility for evaluating journals, as it provides statistical data for evaluating the world's leading journals and their impact on the global research community.

SUMMARY AND CONCLUSIONS

Due to time constraint, this study is limited to journal articles published by IRRI Staff. It would be ideal to include other types of publications in future studies, e. g. conference proceedings,

[4]Thomson-Scientific web site is at http://scientific.thomson.com/isi/
[5]Journal Citation Reports information given at http://scientific.thomson.com/products/jcr/

books, etc. This limited coverage is also attributed to the lack of instruments for analyzing other genre.

The same is true with the limited journal ranking data. Getting the current journal rankings is not possible as the ***Journal Citations Reports*** available in the LDS came out in 2004 yet. The high cost of JCR does not warrant annual subscription.

The following generalizations were shown by this study.

- IRRI Scientists shared 705 research results through 224 journals published between 2000 and 2004
- Out of the 705 papers, 477 were cited 6,981 times by other scientists
- 228 papers were not cited but this is not conclusive.
- There is an increase of 116 papers over the 5-year period (1998-2002) covered by an earlier study conducted in 2005.
- The number of journal titles that published IRRI works also increased from 190 in 2005 to 224 or an increase of 34 titles.
- IRRI scientists prefer to publish their works in peer-reviewed journals published by well-known publishers.
- There are only 2 open access journals in the top 10 journals selected by scientists in sharing their works.
- GS generally reports more citations than SCO or WOS, as the former indexes proceedings, reports, and open access sources.
- National journals are not cited as frequently or do not enjoy as much usage as their international counterparts. This is not conclusive, however, as there are no instruments to use in tracking citations of articles published in national journals.
- Citations of IRRI publications are on the uptrend. The increasing number of citations of IRRI papers is an indication of the better impact of IRRI's research in the world community.

Suggestions for the improvement of this paper is welcome.

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Bauer, K., & Bakkalbasi, N. (2005). An Examination of citation counts in a new scholarly communication environment 2005. *D-Lib Magazine 11*(9). Sept. http://www.dlib.org/dlib/september05/bauer/09bauer.html

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Perkel, J. M. (2005). The future of citation analysis. *The Scientist 19*(20), 24- http://www.the-scientist.com/2005/10/24/24/1/

Ramos, M. M., et al.(2005). *Knowledge Sharing in Rice Research. 2. The Literature Output of International Rice Research Institute Scientists, 1998-2002*. Los Baños, Laguna.

The Impact of Open Access Journals A Citation Study from Thomson ISI. (2004). http://thomsonscientific.com/media/presentrep/acropdf/impact-oa-journals.pdf

APPENDIX I.

Highly Cited IRRI Journal Publications (>29), 2000-2004

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
	2000				
Zhu, Y.Y., Chen, H., Fan, J.H., Wang, Y.Y., Li, Y., Chen, J.B., et al. (2000). Genetic diversity and disease control in rice. *Nature, 406,* 718-722.	EPPD	121	131	243	243
Joshi, S.P., Gupta, V.S., Aggarwal, R.K., Ranjekar, P.K., & Brar, D.S. (2000). Genetic diversity and phylogenetic relationship as revealed by inter simple sequence repeat (ISSR) polymorphism in the genus Oryza. *Theoretical and Applied Genetics, 100*, 1311-1320.	PBGB	58	68	109	109
Tu, J., Zhang, G., Datta, K., Xu, C., He, Y., Zhang, Q., et al. (2000). Field performance of transgenic elite commercial hybrid rice expressing Bacillus thuringiensis delta-endotoxin. *Nature Biotechnology, 18*, 1101-1104.	PBGB	54	64	95	95
Bouman, B.A.M., & Tuong, T.P. (2000). Field Water management to save water and increase its productivity in irrigated rice. *Agricultural Water Management, 49*(1), 11-30.	CSWS	53	50	54	54
Bai, J.F., Choi, S.H., Ponciano, G., Leung, H., & Leach, J.E. (2000). Xanthomonas oryzae pv. Oryzae avirulence genes contribute differently and	EPPD	49	50	47	50

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
specifically to pathogen aggressiveness. *Molecular Plant Microbe Interactions, 13,* 1322-1329.					
Yin, Z., Chen, J., Zeng, L., Goh, M., Leung, H., Khush, G.S. et al. (2000). Characterizing rice lesion mimic mutants and identifying a mutant with broad-spectrum resistance to rice blast and bacterial blight. *Molecular Plant Microbe Interactions, 13,* 869-876.	EPPD	36	42	47	47
Sanchez, A.V., Brar, G.S., Huang, N., Li, Z., & Khush, G.S. (2000). Sequence tagged site, marker-assisted selection for three bacterial flight resistance genes in rice. *Crop Science, 40,* 792-797.	PBGB	14	46	25	46
Vera Cruz, C.M., Bai, J.F., Ona, I., Leung, H., Nelson, R.J., Mew, T.W., et al. (2000). Predicting durability of a disease resistance gene based on an assesment of the fitness loss and epidemiological consequences of avirulence gene mutation. *Proceedings of the National Academy of Sciences, 97*(25), 13500-13505.	EPPD	20	43	35	43
Dawe, D., Dobermann, A., Moya, P., Abdulrachman, S., Bijay-Singh, Lal, P., Li, S.Y., et al. (2000). How widespread are yield declines in long-term rice experiments in Asia? *Field Crops Research, 66,* 175-193.	SSD	40	41	34	41
Virk, P.S., Zhu, J., Newbury, H.J., Bryn, G.J., Jackson, M.T., & Ford-Lloyd, B.V. (2000). Effectiveness of different classes	PBGB	21	35	29	35

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
of molecular marker for classifying and revealing variation in rice (Oryza sativa) germplasm. *Euphytica, 112,* 275-284.					
Yencho, G.C., Cohen, M.B., & Byrne, P.F. (2000). Applications of tagging and mapping insect resistance loci in plants. *Annual Review of Entomology, 45*, 391-420.	EPPD	33	34	35	35
Witt, C., Cassman, K.G., Olk, D.C., Biker, U., Liboon, S.P., Samson, M.I.,et al. (2000). Crop rotation and residue management effects on carbon sequestration, nitrogen cycling and productivity of irrigated rice systems. *Plant and Soil*, *225,* 263-278.	CSWS	28	34	30	34
Biswas, J.C., Ladha, J.K., & Dazzo, F.B. (2000). Rhizobia inoculation improves nutrient uptake and growth of lowland rice. *Soil Science Society of America Journal, 64*, 1644-1650.	CSWS	25	33	26	33
Hussain, F., Bronson, K.F., Yadvinder-Singh, Bijay-Singh, & Peng, S. (2000). Use of chlorophyll meter sufficiency indices for nitrogen management of irrigated rice in Asia. *Agronomy Journal, 92*, 875-879.	CSWS	16	33	17	33
Datta, K., Koukoolikova-Nicola, Z., Baisakh, N., Oliva, N., & Datta, S.K. (2000). Agrobacterium-mediated engineering for sheath blight resistance of indica rice cultivars from different ecosystems. *Theoretical and Applied Genetics, 100*,	PBGB	23	26	32	32

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
832-839.					
Osborne, C.P., Mitchell, P.L., Sheehy, J.E., & Woodward, F.I. (2000). Modeling the recent historical impacts of atmospheric CO_2 and climate change on Mediterranean vegetation. *Global Change Biology, 6,* 445-458.	CSWS	24	32	28	32
Biswas, J.C., Ladha, J.K., Dazzo, F.B., Yanni, Y.G., & Rolfe, B.G. (2000). Rhizobial inoculation influences seedling vigor and yield of rice. *Agronomy Journal, 92,* 880-886.	CSWS	29	31	27	31
Gregorio, G.B., Senadhira, D., Htut, T., & Graham, R.D. (2000). Breeding for Trace Mineral Density in Rice. *Food and Nutrition Bulletin, 21*, 382-386.	PBGB	0	26	31	31
Savary, S., Willocquet, L., Elazegui, F.A., Castilla, N.P., & Teng, P.S. (2000). Rice pest constraints in tropical Asia: Quantification of yield losses due to rice pests in a range of production situations. *Plant Disease, 84,* 357-369.	EPPD	29	30	24	30
Yang, J., Peng, S., Visperas, R.M., Sanico, A.L, Zhou, Q., & Gu, S. (2000). Grain filling pattern and cytokinin content in the grains and roots of rice plants. *Plant Growth Regulation, 30*(3), 261-270.	CSWS	24	25	30	30
	2001				
Li, Z.K., Luo, L.J., Mei, H.W., Wang, D.L., Shu, Q.Y, Tabien, R., et al. (2001). Overdominant	PBGB	55	54	65	65

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
epistatic loci are the primary genetic basis of inbreeding depression and heterosis in rice. I. Biomass and grain yield. *Genetics, 158*(4), 1737-1753.					
Leach, J.E., Cruz, C.M.V., Bai, J., & Leung, H. (2001). Pathogen fitness penalty as a predictor of durability of disease resistance genes. *Annu. Rev. Phytopathol., 39,* 187-224.	EPPD	61	59	63	63
Luo, L.J., Li, Z.K., Mei, H.W., Shu, Q.Y., Tabien, R., Zhong, D.B., et al. (2001). Overdominant epistatic loci are the primary genetic basis of inbreeding depression and heterosis in rice. II. Grain yield components. *Genetics, 158*(4), 1755-1771.	PBGB	45	61	51	61
Bouman, B.A.M., & Tuong, T.P. (2001). Field water management to save water and increase its productivity in irrigated rice. *Agric. Water Manage., 49*(1), 11-43.	CSWS	53	54	58	58
Singh, S., Sidhu, J.S., Huang, N., Vikal, Y., Li, Z., Brar, D.S., et al. (2001). Pyramiding three bacterial blight resistance genes (xa5, xa13, Xa21) using marker-assisted selection into indica rice cultivar PR106. *Theor. Appl. Genet., 102*(6-7), 1011-1015.	PBGB	43	56	42	56
Wang, G.H., Dobermann, A., Witt, C., Sun, Q.Z., & Fu, R.X. (2001). Performance of site-specific nutrient management for irrigated rice in Southeast China.	CSWS	16	48	16	48

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
Agron. J., 93(4), 869-878.					
Zhang, J., Zheng, H.G., Aarti, A., Pantuwan, G., Nguyen, T.T., Tripathy, J.N., et al. (2001). Locating genomic regions associated with components of drought resistance in rice: comparative mapping within and across species. *Theor. Appl. Genet., 103*(1), 19-29.	PBGB	35	46	44	46
Gyaneshwar, P., James, E.K., Mathan, N., Reddy, P.M., Reinhold-Hurek, B., & Ladha, J.K. (2001). Endophytic colonization of rice by a diazotrophic strain of Serratia marcescens. *J. Bacteriol., 183*(8), 2634-2645.	CSWS	36	31	43	43
Shi, Z.X., Chen, X.M., Line, R.F., Leung, H., & Wellings, C.R. (2001). Development of resistance gene analog polymorphism markers for the Yr9 gene resistance to wheat stripe rust. *Genome, 44*(4), 509-516.	EPPD	22	40	23	40
Khush, G.S. (2001). Green revolution: the way forward. *Nat. Rev. Genet., 2*(10), 815-822.	PBGB	31	38	33	38
Datta, K., Tu, J., Oliva, N., Oña, I., Velazhahan R., Mew T.W., et al. (2001). Enhanced resistance to sheath blight by constitutive expression of infection-related rice chitinase in transgenic elite indica rice cultivars. *Plant Sci., 160*(3), 405-414.	PBGB	26	32	30	32

Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
Li, Z.K., Sanchez, A., Angeles, E., Singh, S., Domingo, J., Huang, N., et al. (2001). Are the dominant and recessive plant disease resistance genes similar?: a case study of rice R genes and Xanthomonas oryzae pv. oryzae races. *Genetics, 159*(2), 757-765.	PBGB	26	32	26	32
Miyamoto, N., Steudle, E., Hirasawa, T., & Lafitte HR. (2001). Hydraulic conductivity of rice roots. *J. Exp. Bot., 52*(362), 1835-1846.	CSWS	25	32	30	32
Shen, L., Courtois, B., McNally, K.L., Robin, S., & Li, Z. (2001). Evaluation of near-isogenic lines of rice introgressed with QTLs for root depth through marker-aided selection. *Theor. Appl. Genet., 103*(1), 75-83.	GRC	26	31	30	31
	2002				
Sasaki, A., Ashikari, M., Ueguchi-Tanaka, M., et.al. (2002 Apr 18). A mutant gibberellin-synthesis gene in rice. *Nature, 416*(6882), 701-702.	PBGB	49	84	37	84
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Journal Articles	Division	WOS	SCO	GS	Highest No. of Citations
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Hirochika, H., Guiderdoni, E., An, G., Hsing, Y.I., Eun, M.Y., Han, C.D., et al. (2004). Rice mutant sources for gene discovery. *Plant Mol. Biol., 54,* 325-334.	EPPD			33	33