

# A Bibliometric analysis of physiology and management in China based on three major agronomic journals

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## *Abstract*

*The study of rice has long been a main concern in China, and the nation reliably distributes the most papers in insightful diaries regarding the matter, especially in the space of rice reproducing and hereditary qualities. A bibliometric approach was utilized to inspect the examples in papers on rice physiology and the board distributed by Chinese scientists. On September 8, 2017, the Web of Science was looked for three significant agronomic diaries (Agronomy Journal, Crop Science, and Field Crops Research). Since their beginning, Chinese yield physiologists and directors have distributed an aggregate of 186 papers in these three diaries. For the years 1993-2005, 2006-2011, and 2012-2017, the normal number of these papers each year was 1.6, 6.5, and 21.0. Reference execution has additionally worked on altogether throughout the most recent ten years for these creators. The greater part of the 186 papers were distributed by the three driving establishments: Huazhong Agricultural University, Yangzhou University, and Nanjing Agricultural University. Most papers on rice crop physiology and the executives were first or co-authored by Hunan Agricultural University's Huang Min and Huazhong Agricultural University's Peng Shaobing. As a result of this, rice crops have been studied extensively for their yield potential and for their ability to efficiently use nitrogen. Studies into the effects of global warming, such as the critical nitrogen dilution curve and high temperature stress on crops, have grown in popularity in recent years. Rice ratooning, yield gap, and simplified and reduced-input practises are all the subject of new research.*

**Keywords:** *agronomic journals, bibliometric analysis, China, crop management, crop physiology, rice*

## **1. Introduction**

More than 65 percent of Chinese people eat rice as their main meal, making it critical to the country's food security (Zhang et al., 2005). Because of the advances in rice research and development, China's rice yield has increased more than twofold in the last five decades (FAO 2017). The Chinese government spends the most on rice research of any major crop. For example, the National Natural Science Foundation of China has funded rice 2.5 times more than maize over the last two decades (Liu et al. 2017b).

Genetic and management improvements are necessary to increase crop yields. Crop management and plant breeding have traditionally been considered equally important by agricultural scientists when it comes to increasing crop yield (Peng 2008). Because it is more challenging to increment rice yield potential through rearing, further developed crop the board, and environment brilliant harvest the executives practices may ultimately overwhelm hereditary improvement in rice yield, the commitment of yield the board may ultimately outperform hereditary improvement in rice yield.

As of late, the Chinese government has placed a more prominent accentuation on crop the executives research. "Fundamental Research on High Yield Cultivation and Resource Efficient Utilization of Main Grain Crops" was sent off in 2009 by the Ministry of Science and Technology (MOST). The MOST's National Basic Research Program (973 Program) has interestingly given financing to a venture zeroing in on crop the board. Beginning around 2004, the MOST has likewise upheld the Science and Technology Engineering Project for Grain Bumper Harvest, which essentially advances applied research on better yield the board rehearses and their reception for the three significant grain crops. starting around 2004. (i.e., rice, wheat, and maize). Crop physiology and the board rehearses for high return and high productivity in the creation frameworks of significant harvests were upheld from 2012 to 2016 by the Special Fund Program for Agro-logical Research in the Public Interest of China (MOA) from the Ministry of Agriculture. Research on rice crop physiology and the executives, in particular, has seen an increase in funding thanks to these projects over the last decade in China.

## **2. Data and methodology**

A total of two sets of Web of Science data were gathered on September 8th, 2017. When compiling this first dataset, we focused on AJ, CS, and FCR papers that had rice in their titles since their establishment. This search turned up 1688 documents. To narrow the search further, only papers with the word "China" in

their title were selected. The second search yielded 331 results. In order to calculate the percentage of rice papers published in the three journals with authors from Chinese research organisations each year since their establishment to September 8, 2017, these data were used. Web of Science's search was restricted to SCI-EXPANDED, with only articles and the English language as document types.

Using rice as a keyword, we conducted a topic search in the three journals and only included papers with "China" in the address. In this search, there were 420 papers found. To ensure that all rice papers were included, a topic search was conducted instead of a title search. In order to bar papers on crops other than rice and remember just papers for crop physiology and the executives, these 420 papers were explored. Many rice-wheat framework research papers were saved. Physiology and the board of yields were the essential focal point of papers on a wide scope of themes, including rice assortments like super rice, high-impact rice, and Bt rice, soil richness and quality, infections, and biochar. A final requirement was that all of the papers' first or corresponding authors were Chinese academics. After the above screening, 186 papers remain. Next, each of the 186 papers had to be assigned to a Chinese organisation. 19 out of the 186 papers had the corresponding author's address in a foreign country, but the first author had recently returned or been working in China. The first Chinese organisation on the affiliation list was used for these 19 papers. 186 papers, according to Chen (2006) and Chen et al. (2006), were subjected to a network analysis of scientific research collaborations using CiteSpace 5.0. (2012).

### **3. Results**

First papers with rice in the title were not distributed in AJ until 1962 while the other two diaries distributed their first rice papers around the same time they were laid out (Fig. 1). Interestingly, AJ, CS and FCR teamed up with Chinese scientists to distribute a rice paper in 2001, in 1987 and 1994 separately (Fig. 1). Whenever the three diaries began following this information, the level of rice papers with creators from Chinese exploration associations to the all out rice papers rose quickly over the long haul For AJ, CS, and FCR, it reached a high of 55.6% in 2016, 71.4% in 2014, and 54.5 percent in 2017.

As depicted in Fig. 2, only articles on rice published by Chinese scientists as first or it are incorporated to relate creators. In 2001, AJ, CS, and FCR distributed the main papers of this kind. From that point forward, the utilization of this sort of rice paper in FCR has developed essentially. Following AJ and

CS, FCR distributed the most papers on rice crop physiology and the board in China. Research on rice crop physiology and the executives has seen a critical increase in China lately, as proven by an expansion in the quantity of rice papers distributed every year in the three yield physiology and the board journals from 1993–2005, 2006–2011, and 2012–2017 (Fig. 3-A).

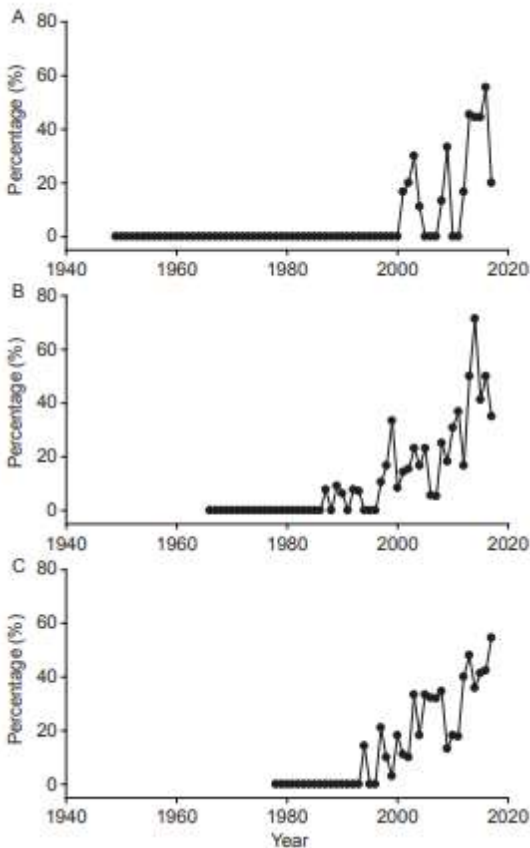


Fig. 1 Patterns in the level of rice papers with creators from Chinese examination associations to add up to rice papers from the start of the diary foundation to September 8, 2017 in Agronomy Journal (A), Crop Science (B), and Field Crops Research (C). Rice papers are those with "rice" in the title from Web of Science

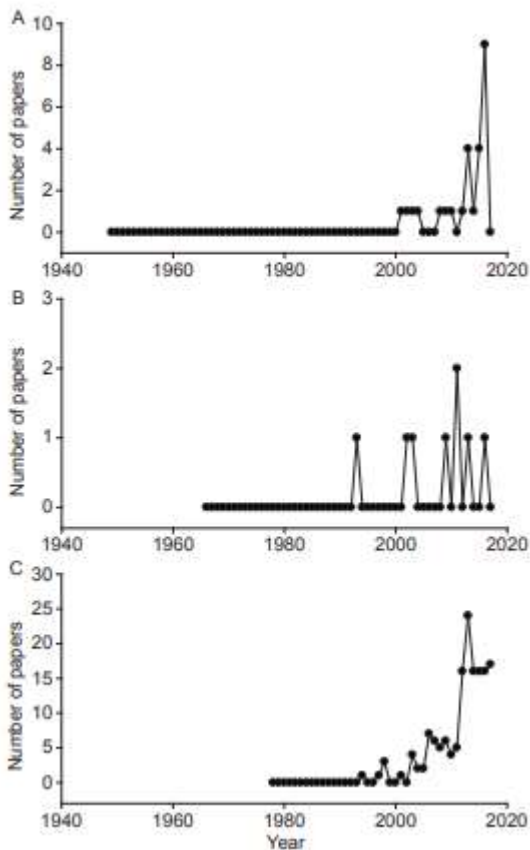


Fig. 2 Changes in the quantity of rice papers distributed by Chinese specialist as the first or relating creator on rice physiology and the executives in Agronomy Journal (A), Crop Science (B), and Field Crops Research (C). The period covers from the start of the diary foundation to September 8, 2017.

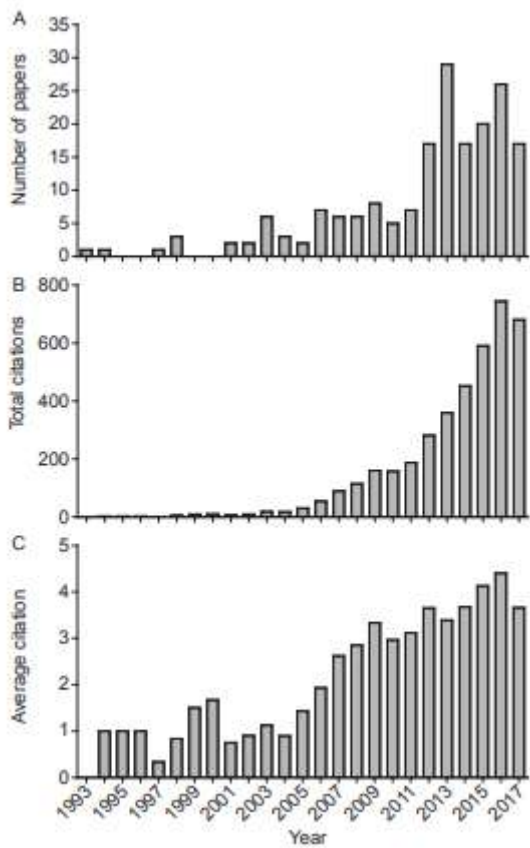


Fig. 3 The quantity of rice papers and their reference execution from 1993 to September 8, 2017. These papers were distributed by Chinese specialists as the first or relating creator on rice physiology and the board in Agronomy Journal, Crop Science, and Field Crops Research. No such paper was distributed before 1993 in these three diaries. Normal reference was the quantity of references per paper and each year.

Fig. 4 depicts the 186 papers' organisations (including all collaborating organisations and foreign organisations). There are 186 papers in this collection, and the most common keywords are shown in Table 4. On the first page of search results, three of the top five keywords had something to do with nitrogen (N).

Total citations of rice papers published in crop physiology and management in AJ, CS, and FCR by Chinese researchers as the first or corresponding author have also risen rapidly in the last few years (Fig. 3-B). Between 1993 and 2006, the average number of citations per paper was 1.0; however, from 2006 to 2017, that number increased to 3.4. (Fig. 3-C). Fig. 5 depicts the h-index and total number of citations for all 186 papers. It was found that the h-index of the 186 papers studied had a maximum value of 34. Table 5 shows how many of the 186 papers have co-authors from other countries. The Philippines was the most

frequent partner, followed by the United States and Germany. More citations are generated by international collaborations than by those without international collaboration.

Philippines, USA, and Germany in that order. Citation performance is significantly higher for papers involving international collaboration than for papers not involving international collaboration.

#### 4. Discussion

Journal Citation Reports, ISI, and Clarivate Analytics order 83 diaries as agronomic diaries. Scientists have distributed papers on rice crop physiology and the board in diaries with sway factors more prominent than 1, including Agronomy for Sustainable Development (ASD), Agronomy for Applied Research (AAR), the European Journal of Agronomy (EJA), the Journal of Agronomy and Crop Science (JACS), Rice, and others. Scientists in China distributed 25, 11, 8, and 6 rice-related papers as the first or comparing creator in EJA, JACS, ASD, and Rice between the diary's origin and September 8, 2017 (information not shown). Examination of the 186 rice papers distributed by Chinese analysts in the fields of crop physiology and management was carried out in this study using the bibliometric method.

Table 1 Chinese research organizations that published at least four papers on rice physiology and management in Agronomy Journal, Crop Science, and Field Crops Research1)

Organization	No. of papers	Percentage (%)
Huazhong Agricultural University	39	21.0
Yangzhou University	34	18.3
Nanjing Agricultural University	28	15.1
China Agricultural University	15	8.1
Hunan Agricultural University	13	7.0
Chinese Academy of Sciences	11	5.9
Zhejiang Agricultural University	7	3.8
Chinese Academy of Agricultural Sciences	6	3.2
Sichuan Agricultural University	6	3.2
China National Rice Research Institute	4	2.2

#### 5. Conclusion

Papers on rice physiology and management by Chinese researchers have increased dramatically over the past decade in the most prominent agricultural journals. As China's economy grows, we can expect this trend to continue. As China's rice production faces new challenges, more research into rice

physiology and management is required. To ensure long-term rice production in an ever-shifting environment, scientists are expected to devote more time and resources to studying rice physiology and management.

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