

# Yuan Longping, Hybrid Rice, and the Meaning of Science in the Cultural Revolution and Beyond

Sigrid Schmalzer<sup>1</sup>

University of Massachusetts Amherst, United States

**This paper uses the case of hybrid rice to chart changes in the meanings science has carried in China from the Mao era to today. It begins by using Chinese journal articles to reconstruct the 1970s development of hybrid rice technology by a network of diverse historical actors. It then documents the emergence during the Hua Guofeng era (1976–1978) of a historical narrative of hybrid rice centered on the figures of Yuan Longping and Hua Guofeng. Finally, it surveys post-1978 biographies of Yuan Longping to identify changes and continuities in scientific values. The paper demonstrates that, although the reform era has witnessed the replacement of most of the Maoist vision of mass (or *tu*) science with a vision far more consistent with the values of international, professional (*yang*) science, the legacy of the Mao era can still be seen in a continued emphasis on certain aspects of Mao Zedong Thought, a strong narrative of nationalist triumphalism, and a celebration of Yuan Longping as an “intellectual peasant.”**

## Introduction

The year 2016 marked the fiftieth anniversary of the beginning of the Cultural Revolution. As the Chinese Communist Party (CCP) wrestles with how to memorialize this difficult period in its history, the recognition of other events from 1966 can provide a welcome diversion. Perhaps this helps explain the recent public commemoration of an article on the discovery of male-sterile rice plants, also dating from 1966 and published in the premier journal, *Chinese Science Bulletin*.<sup>2</sup> The article would be of dubious interest if it had not been authored by Yuan Longping (Figure 1), who is a household name in China

Corresponding author: Schmalzer, S. ([sigrid@history.umass.edu](mailto:sigrid@history.umass.edu)).

Keywords: Yuan Longping; Agricultural science; Hybrid rice; Genetics; Mass science; Tu and Yang; Cultural Revolution; China.

Available online 24 June 2017

<sup>1</sup> This article is adapted from the chapter “Yuan Longping: ‘Intellectual Peasant,’” in my book *Red Revolution, Green Revolution: Scientific Farming in Socialist China* (Chicago: University of Chicago Press, 2016). In revising the material for publication here, I am indebted to Fa-ti Fan, Danian Hu, Grace Shen, Zuoyue Wang, and Zeng Xiongsheng for their helpful critiques and suggestions.

<sup>2</sup> “Hunan nongkeyuan longzhong jinian Yuan Longping 《Shuidao de xiongxing buyunxing》yi wen fabiao 50 zhou nian” [“The Hunan Academy of Agricultural Sciences Ceremoniously Commemorates the Fiftieth Anniversary of Yuan Longping’s Article ‘Male-Sterility in Rice’”], accessed October 3, 2016, <http://blog.sciencenet.cn/blog-528739-1004607.html>.

thanks to a veritable industry of biographies celebrating him as the inventor of hybrid rice—which since the mid-1980s has reportedly increased rice production enough to feed an extra sixty million people each year.<sup>3</sup> Honoring Yuan’s 1966 article reminds the public of China’s current scientific and economic prowess. Moreover, it serves Chinese President Xi Jinping’s call to recognize the roots of that prowess not only in the “historical period since reform and opening” (i.e., since 1978), but also in the “historical period before reform and opening” (i.e., before 1978).<sup>4</sup>

It would be hard to identify a living scientist with as much name recognition in the United States as Yuan Longping has in China. Undoubtedly this says much about the economic significance of rice in China: no one is celebrated for having invented hybrid sorghum, though it predated hybrid rice and involved similar challenges. It also says something about the significance afforded to science in Chinese popular culture. The success of hybrid rice could be credited just as easily to the agricultural policies of the Deng Xiaoping era, which allowed for the expansion of the production area of hybrid rice, as to the technological innovations of the 1960s and 1970s. That the story of hybrid rice has been framed as a scientific victory rather than merely a policy triumph speaks to the power of science in the cultural imagination. Moreover, the story of hybrid rice serves a growing interest, especially under the leadership of Xi Jinping, in salvaging something worthy from the rocky history of the Cultural Revolution. And yet running alongside this, ironically, is the fact that Yuan Longping was almost invisible in Mao-era sources: his fame is entirely a product of post-Mao publicity.

An examination of just how Yuan Longping came to be exalted tells us much about changes and continuities in the meaning of science in China. Mao-era political ideology

<sup>3</sup> “Daozuo gaikuang” [“A Survey of Rice Cultivation”], *Rice Knowledge Bank*, accessed 1 October 2016, [http://www.knowledgebank.irri.org/index.php?option=com\\_zoo&view=item&layout=item&Itemid=857](http://www.knowledgebank.irri.org/index.php?option=com_zoo&view=item&layout=item&Itemid=857). According to official statistics, hybrid rice constituted 34% of total rice planted in China by 1987. Justin Yifu Lin, “Hybrid Rice Innovation in China: A Study of Market-Demand Induced Technological Innovation in a Centrally-Planned Economy,” *The Review of Economics and Statistics* 74, no. 1 (1992): 14–20.

<sup>4</sup> Li Zhangjun and Huang Jingwen, “Haobu dongyao jianchi he fazhan Zhongguo tese shehui zhuyi” [“Be Unwavering in Persisting with and Developing China’s Socialism with Special Characteristics”], *Renmin ribao*, January 6, 2013, 1.



**Figure 1.** A commonly reproduced photograph of Yuan Longping (squatting). I collected this example at Panjiayuan antiques market in Beijing on a search for “materials related to agriculture”.

produced an ideal of science in which native Chinese and mass-based knowledge (termed *tu*) would be harnessed together with Western, professional knowledge (termed *yang*) to transform China into a modern, socialist nation (see also Wendy Chia-Chen Fu’s contribution to this volume). Although the call to “unite *tu* and *yang*” (*tuyang jiehe* or *tuyang bingju*) secured a role for professional knowledge, frequent political campaigns underscored the greater ideological value of what we may call “*tu* science”—that is, science that downplayed individual achievements and emphasized mass mobilization and local self-reliance.<sup>5</sup> With the ideological transformation of China after 1978, which included a repudiation of the Cultural Revolution’s radical politics, the emphasis placed on *tu* science changed in favor of a professional (or *yang*) model glorifying individual achievements made legible on an international stage. However, the values established in the Mao era have by no means disappeared. Rather, the valorization of Party leadership, the expectation that scientists should embody both *yang* and *tu* qualities, and the salience of nationalism in the face of geopolitical power structures stand as important priorities that continue to shape the significance of science in China today. Thus, the changing stories told about Yuan Longping and the invention of hybrid rice do not merely represent political expediences but testify to questions at the very

heart of our discipline: what constitutes “science,” and how has this transformed over time?

### Yuan Longping from the Vantage of Mao-Era Sources

When renowned rice breeder Yuan Longping (1930–) was of age to begin college, the communists were just months away from victory in the civil war. And so, unlike many of Mao-era China’s leading agricultural scientists, Yuan had no opportunity to travel to the United States for graduate school. Upon graduation from the newly established Southwestern Agricultural University in 1953, Yuan was assigned to teach at Qianyang Agricultural School in the remote hills of western Hunan province, where many of his students were young peasants bound to return to their hometowns after graduation.

Yuan authored only one article during the Mao era. In the April 1966 issue of *Chinese Science Bulletin*, Yuan reported on his discovery of mutant male-sterile rice plants, the first critical step on the road to tapping the benefits of hybrid vigor in rice.<sup>6</sup> Hybrid corn had long since been in production around the world, but the challenges with self-pollinating plants like rice and sorghum were much greater. Rice in particular has a very low rate of cross-pollination—more than 95 percent of the time rice seeds are produced by the male and female parts of a single rice plant. Thus, in order to hybridize two rice plants, one of the plants must first have the male parts removed so that it will not fertilize itself. It can then be exposed to the pollen from another plant so that its seeds will contain the genetic material from both plants. This was already a standard practice in the production of new varieties of rice. However, the phenomenon of “hybrid vigor” (or heterosis) applies only to the first generation (called  $F_1$ ) of plants produced through this crossing. So, the new variety may have many useful qualities and be worth stabilizing and putting into production as an “improved variety,” but those first-generation hybrid plants will typically perform significantly better than the later generations. The trick with hybrid rice, as with hybrid corn, was to find a convenient way to repeat the hybridization process on a large scale every year, so that farmers could be provided with large quantities of seed that would grow into first-generation hybrid plants. For rice, this meant finding plants that were already male-sterile so that each individual plant would not have to be sterilized by hand. Yuan’s discovery of a male-sterile plant was thus worthy of attention from China’s most important science journal.

After this one article, published on the eve of the Cultural Revolution, Yuan’s name disappeared from print until several months after Mao’s death and the fall of the Cultural Revolution radicals. However, an article published in 1972 in *Agricultural Science and Technology News* under the name Qianyang School of Agriculture Scientific Research Group was undoubtedly his creation. By this time, Yuan and his colleagues had given up on the male-sterile line they had identified in 1964 among the cultivars in their fields, but after a painstaking search, they had found on the island of Hainan a male-sterile plant

<sup>5</sup> See Schmalzer, *Red Revolution, Green Revolution* (ref. 1).

<sup>6</sup> Yuan Longping, “Shuidao de yongxing buyunxing” [Male Sterility in Rice], *Kexue tongbao* 1966, no. 4: 185–88.

Download English Version:

<https://daneshyari.com/en/article/5130221>

Download Persian Version:

<https://daneshyari.com/article/5130221>

[Daneshyari.com](https://daneshyari.com)