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In memory of Prof. Hongsheng Zhang

Ji Huang[1*], Yongmei Bao[1], Shinan Dong[1], Song Shi[2], Keyan Yao[3] and Yanxiao Jia[1]

[1] *State Key Laboratory of Crop Genetics & Germplasm Enhancement and Utilization, Jiangsu Collaborative Innovation Center for Modern Crop Production, Jiangsu Province Engineering Research Center of Seed Industry Science and Technology, College of Agriculture, Nanjing Agricultural University, Nanjing 210095, China*

[2] *Office of International Relations, Nanjing Agricultural University, Nanjing 210095, China*

[3] *Education Development Foundation, Nanjing Agricultural University, Nanjing 210095, China*

* Corresponding author, E-mail: huangji@njau.edu.cn

Prof. Dr. Hongsheng Zhang, a renowned rice expert, professor at the College of Agriculture of Nanjing Agricultural University, head of the Seed Science and Technology discipline, and a member of the Editorial Board of Seed Biology，passed away unexpectedly at 9:58 AM on July 28, 2025, aged 62, in Nanjing, Jiangsu province, China.

Academic journey: devotion to rice research and fortifying scholarly foundations

Prof. Zhang was born on October 6, 1962, in Qidong City, Jiangsu Province, China. In 1978, he enrolled in Nanjing Agricultural College (now Nanjing Agricultural University), thus forging a lifelong bond with rice research. In 1982, he graduated with a Bachelor of Agronomy degree from the Department of Agronomy at Nanjing Agricultural College. After his undergraduate studies, he continued his education at the same institution, pursuing graduate studies in Plant Pathology in the Department of Plant Protection at Nanjing Agricultural University, earning his Master's degree in 1985 and his Ph.D. in Plant Pathology in 1988, laying a solid theoretical foundation for his subsequent scientific research.

While deeply engaged in domestic academia, he actively expanded his international academic horizons, undertaking multiple visits and research stays at renowned overseas universities, deeply integrating into the forefront of international plant science. From 1991 to 1992, he visited and studied at the Department of Plant Breeding, Wageningen University, the Netherlands. From 1992 to 1993, he conducted postdoctoral research at the Institute of Plant Pathology, University of Göttingen, Germany. From 1998 to 2000, he visited and studied at the College of Agriculture and Life Sciences, Cornell University, USA. These transnational, interdisciplinary academic experiences not only supported the expansion and breakthrough of his research directions but also became an important foundation for promoting disciplinary development and international cooperation, contributing to serving the nation's agricultural science and technology development.

Discipline construction: advancing seed science and nurturing talent

Prof. Zhang concurrently served as Vice President of the Crop Seed Professional Committee of the Chinese Crop Society, and Vice Chairman of the Teaching Guidance Sub-Committee for Seed Science and Engineering of the Ministry of Education, China. As the leader in establishing the 'Seed Science and Technology' discipline point, and the 'Seed Science and Engineering' undergraduate major at Nanjing Agricultural University, he spearheaded the formulation of discipline and major construction plans, efficiently coordinated team efforts, and drove repeated breakthroughs in professional construction: the 'Seed Science and Engineering' major was selected as a Key Major of Jiangsu Province's '12th Five-Year Plan' for Higher Education Institutions in 2012, recognized as a National First-Class Undergraduate Major Construction Point and a Phase II Project of the Jiangsu Provincial University Brand Major Construction Project in 2019, and selected as a Jiangsu Provincial Undergraduate Industry-Education Integration Brand Major in 2023. Furthermore, he used major construction as an opportunity to promote interdisciplinary integration, focused on innovating talent cultivation models oriented towards industry needs, deepened university-enterprise cooperation, and facilitated the joint establishment of postgraduate workstations by Nanjing Agricultural University with Jiangsu Tomorrow Seed Technology Co., Ltd., Jiangsu Dahua Seed Group Co., Ltd., and Jiangsu Jin Hualong Seed Technology Co., Ltd.

He consistently emphasized the deep integration of textbook construction and educational practice, building a solid foundation for seed industry talent cultivation. He served as chief editor or co-author for a total of eight textbooks and monographs. Among them, Seed Science won multiple provincial and ministerial-level outstanding textbook awards, becoming a core textbook in the field of seed science in China; Introduction to Chinese Agriculture (English Version) was included in the Ministry of Agriculture's first batch of '12th Five-Year Plan' National Planning Textbooks for regular higher education undergraduate programs, providing important teaching resources for cultivating international agricultural talents. Upholding the educational philosophy of 'integrating theory with practice', he deepened university-enterprise cooperation, conducted market research within enterprises, and integrated industry needs into textbooks. *Crop Seed Marketing*, compiled over many years, is soon to be published.

Research career: deepening rice research and scaling academic peaks

Since commencing work in 1988, Prof. Zhang dedicated himself to teaching and research in the field of rice. He held positions including Deputy Director of the Department of Agronomy, Vice Dean of the College of Agriculture, and Head of the Department of Seed Industry Science at Nanjing Agricultural University. He also held numerous important concurrent social roles, such as Director of the Jiangsu Provincial Seed Industry Science and Technology Engineering Research Center, Executive Director of the Rice Industry Branch of the Chinese Crop Society, Council Member of the China Rice Industry Association, Part-time Researcher at the China National Rice Research Institute, Council Member of the Jiangsu Seed Association, and Technical Expert for the Industrialized Development of High-Quality Rice in Jiangsu Province, actively engaging in serving national agricultural development strategies and local science and technology promotion. He also served as an editorial board member for journals including *Chinese Journal of Rice Science*, *Hereditas*,

Molecular Plant Breeding, *Chinese Bulletin of Botany*, *Journal of Nanjing Agricultural University*, and *Seed Biology*.

His research areas were systematic and extensive, covering: the collection, identification, evaluation, and utilization of rice germplasm resources; the genetic mechanisms and gene molecular mapping of important agronomic traits in rice[1–5]; the cloning and functional analysis of genes for disease resistance, pest resistance, and stress tolerance in rice[6,7]; technical research on rice seed genetics, processing, storage, treatment, and testing; as well as industrial practice issues such as breeding and promotion of new rice varieties, seed marketing, and seed industry management. He successively undertook more than 50 national and provincial/ministerial-level projects, including the National '863' Program, National Natural Science Foundation of China Projects, the Ministry of Science and Technology's Transgenic Major Projects, and Jiangsu Provincial Key R & D Projects. He published nearly 190 academic papers in important domestic and international journals such as *Proceedings of the National Academy of Sciences of the United States of America*[5], *The Plant Cell*[3], *Plant Physiology*[4,8], *The Plant Journal*[6,7], *Plant Communications*[2], and the *Plant Biotechnology Journal*[1,9,10], including over 120 SCI-indexed papers. His research findings have had a broad influence on the international plant science community. His scientific research achievements received national and provincial/ministerial-level science and technology awards, including the First Prize for Science and Technology Progress from the Ministry of Education, the Second Prize for Science and Technology Progress from the Chinese Academy of Agricultural Sciences, the Third Prize for Science and Technology Progress from Zhejiang Province, and the Second Prize for Science and Technology Progress from Jilin Province. He was successively awarded honors such as 'Outstanding Young Backbone Teacher of Jiangsu Province', 'Nanjing New Long March Assailant', 'Jiangsu Province 333 Project Talent', 'Nanjing Agricultural University 'Zhongshan Scholar Program' Chief Professor', 'Outstanding Communist Party Member', and 'Outstanding Postgraduate Supervisor'.

Talent cultivation: diligently teaching and mentoring, reaping success with students excelling everywhere

In talent cultivation, he focused on the comprehensive enhancement of students' research capabilities and practical literacy, supervising a total of 159 postgraduate students (including 65 doctoral and 94 master's students), embodying the true essence of education with 'Students Excelling Everywhere'. These students are now spread across research institutes, seed enterprises, and teaching frontlines, each utilizing their strengths to contribute to national agricultural development and seed industry revitalization. Many of his graduate students have grown into national-level talents. He taught 13 courses, including Seed Science, Seed Biology, and Introduction to Chinese Agriculture (Full English), which were deeply loved and highly praised by students. The online course Seed Science, for which he was the responsible lead, was recognized as a 2019 University-Level First-Class Online Course. Introduction to Chinese Agriculture (Full English), for which he was the responsible lead, was recognized as a 2024 Outstanding Course on China's National Conditions for International Students in Jiangsu Universities. He also received the 2021 Jiangsu Provincial Teaching Achievement Second Prize and the 2020 Nanjing Agricultural University Teaching Achievement Grand Prize. These honors are not only a high recognition of his deep engagement in teaching and innovative educational models but also provide strong support for enhancing the teaching quality of the Seed Science and Engineering major and cultivating high-quality application-oriented talents.

He also placed importance on the cultivation of young faculty and team building. In response to the actual situation of weak teaching staff, and a relatively low proportion of young teachers in the Department of Seed Industry Science, he focused on the development needs of the discipline, implemented precise talent recruitment strategies to inject new vitality into the team; on the other hand, he established regular cultivation mechanisms, providing systematic work guidance and experience sharing for young teachers through teaching seminars, research direction discussions, and other forms. Under his mentorship, young teachers achieved improvements in both teaching and research capabilities, and the team gradually built a teaching and research echelon with a reasonable age structure and significantly enhanced innovative vitality, laying a solid talent foundation for the sustainable development of the discipline.

Industry service: driving innovation translation, boosting seed industry revitalization

Based on the screening, identification, and genetic research of high-quality, multi-resistant rice germplasm resources, Prof. Zhang led his team to obtain 43 gene patents and invention patents with independent intellectual property rights, providing critical genetic resources for rice improvement. By integrating conventional breeding with biotechnology, he successfully bred multiple new rice varieties, with 'Nannong Xian 5' and 'Nannong Yan Xian 2' awarded plant new variety rights in 2016 and 2025, respectively. The high-yield, high-quality, disease-resistant 'Ning Dao 1' was licensed to Jiangsu Zhenhua Agricultural Technology Development Co., Ltd. He consistently emphasized the practical application and transformation of scientific research results, actively providing newly developed materials and technologies to breeding units and seed enterprises, directly or indirectly serving the rice industry system.

To implement the action plan for the revitalization of the seed industry, advance the comprehensive implementation of China's seed industry revitalization strategy, enhance germplasm conservation, technological innovation, and commercial breeding systems, since 2014, commissioned by the Seed Industry Administration Division of the Ministry of Agriculture and Rural Affairs, Prof. Zhang presided over and organized 13 training sessions for 11 consecutive years, including the 'National Commercial Breeding System and Breeding Technology Training Course', 'Rice Commercial Breeding and Breeding Information Technology Training', and 'New Commercial Crop Breeding Technology Training Course', cumulatively training over 2,800 participants. He made outstanding contributions to promoting the extension of new commercial crop breeding technologies in China, the construction of commercial crop breeding systems, accelerating the development of the modern seed industry, and the application of agricultural scientific and technological achievements.

Management contributions: exploring management pathways, promoting university development

Prof. Zhang held multiple administrative positions at Nanjing Agricultural University, making significant contributions to the institution's development. From 2005 to 2017, serving as Director of the Office of International Relations (Office of Hong Kong, Macao, and Taiwan), and Dean of the College of International Education, he systematically enhanced the university's global reputation through strategic international collaborations, supporting the construction of a world-class agricultural university. Breakthroughs were achieved

in Africa cooperation: the 'Africa Agricultural Research Center' was established, three 'Go Africa · Seek Development' forums were held, the Ministry of Science and Technology approved the 'China-Kenya Joint Laboratory for Crop Molecular Biology', it was selected for the Ministry of Education's 'China-Africa Universities 20 + 20 Cooperation Plan', an agriculture-focused Confucius Institute and agricultural technology demonstration park were jointly established with Kenya's Egerton University, experts were organized to provide technical training in Kenya, and the 'Chinese Government Scholarship High-Level Graduate Program' was approved. Fruitful results in intellectual introduction: the first 'Disciplinary Innovation and Intelligence Introduction Base for Agricultural Biological Disaster Science' was approved, three foreign experts received the 'Chinese Government Friendship Award', five foreign experts received the 'Jiangsu Friendship Award', the university was rated as a 'National Demonstration Unit for Introducing Foreign Intelligence', promotion of the joint establishment of an 'Agricultural Technology Transfer Center' with Cornell University, and deepening of cooperation with Wageningen University and others in scientific research and joint doctoral training.

From 2015 to 2022, Prof. Zhang served as Director of the Alumni Association Office (Education Development Foundation Office). He led the construction of a global alumni network system, promoting the establishment of 90 regional alumni associations and industry alumni chapters, building professional platforms for exchange and cooperation. Advocating the concept of 'Symbiosis, Sharing, and Win-Win', he spearheaded the establishment of more than 10 special funds, including the 'Talent Introduction Fund' and 'Student Innovation and Entrepreneurship Fund', supporting over 100 projects and benefiting tens of thousands of teachers and students. The foundation's average annual growth rate of total donations received remained above 20% for many consecutive years, cumulatively raising nearly 200 million RMB, providing extensive support and valuable resources for the university's discipline construction, talent cultivation, and scientific research innovation.

Summary and perspective

Prof. Hongsheng Zhang was diligent, thoughtful, courageous in practice, with a selfless dedication throughout his life. He was a model of integrity, simplicity, diligence, and benevolence. With a rigorous scientific spirit and lofty moral character, he worked solidly, blazed new trails, and made outstanding contributions to Nanjing Agricultural University, and the development of the national seed industry. Prof. Qian Qian, academician of the Chinese Academy of Sciences, penned a heartfelt elegy in his memory: 'Jiucaiqing, Guihuahuang-forty years seeking the rice chip, gathering treasures for breeding; Kenya, Uganda-ten thousand miles of wind and rain paving the silk road, sowing hope for agriculture'. These few words encapsulate his over forty years of pursuit in rice research and cultivate talents, and his sincere dedication to aiding agriculture. Today, his unfinished work is being carried forward by his team: in experimental fields, new rice materials follow his footsteps; in laboratories, the projects he guided continue to make breakthroughs. When the breeze brushes over the golden rice waves, the heavy rice ears seem to whisper softly: 'Teacher Zhang, the seeds you sowed have long taken root and sprouted. We will carry forward your legacy and let the rice waves roll towards a brighter future'.

Author contributions

The authors confirm their contributions to the paper as follows: all authors collected data, drafted the manuscript, and approved the final version of the manuscript.

Data availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Conflict of interest

The authors declare that they have no conflict of interest.

Dates

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References

1. Tang Z, Gao X, Zhan X, Fang N, Wang R, et al. 2021. Natural variation in *OsGASR7* regulates grain length in rice. *Plant Biotechnology Journal* 19:14–16
2. Gao X, Li J, Yin J, Zhao Y, Wu Z, et al. 2024. The protein phosphatase qGL3/OsPPKL1 self-regulates its degradation to orchestrate brassinosteroid signaling in rice. *Plant Communications* 5:100849
3. Gao X, Zhang JQ, Zhang X, Zhou J, Jiang Z, et al. 2019. Rice qGL3/OsPPKL1 functions with the GSK3/SHAGGY-like kinase OsGSK3 to modulate brassinosteroid signaling. *The Plant Cell* 31:1077–93
4. Gao X, Zhang J, Cai G, Du H, Li J, et al. 2022. qGL3/OsPPKL1 induces phosphorylation of 14-3-3 protein OsGF14b to inhibit OsBZR1 function in brassinosteroid signaling. *Plant Physiology* 188:624–36
5. Zhang X, Wang J, Huang J, Lan H, Wang C, et al. 2012. Rare allele of *OsPPKL1* associated with grain length causes extra-large grain and a significant yield increase in rice. *Proceedings of the National Academy of Sciences of the United States of America* 109:21534–39
6. Wang Z, Fan Y, Sun J, Ma S, Wang Z, et al. 2025. Pan-analysis of intra- and inter-species diversity reveals a group of highly variable immune receptor genes in rice. *The Plant Journal* 122:e70163
7. Xie T, Xu J, Hu W, Shan S, Gao H, et al. 2024. OsAAH confers salt tolerance in rice seedlings. *The Plant Journal* 120:1954–68
8. Zhang B, Zhu X, Chen Z, Zhang H, Huang J, et al. 2023. RiceTFtarget: a rice transcription factor – target prediction server based on coexpression and machine learning. *Plant Physiology* 193:190–94
9. He Y, Chen S, Liu K, Chen Y, Cheng Y, et al. 2022. *OsHIPL1*, a hedgehog-interacting protein-like 1 protein, increases seed vigour in rice. *Plant Biotechnology Journal* 20:1346–62
10. He Y, Cheng J, He Y, Yang B, Cheng Y, et al. 2019. Influence of isopropylmalate synthase *OsIPMS1* on seed vigour associated with amino acid and energy metabolism in rice. *Plant Biotechnology Journal* 17:322–37