Scientific Research Publishing

Open Journal of Social Sciences, 2026, 14(2), 56-64
https://www.scirp.org/journal/jss
ISSN Online: 2327-5960
ISSN Print: 2327-5952

Strategies for Enhancing the Competitiveness of L Seed Company from an Innovation Perspective

Wenbo Yang, Jian Xue

School of Economics and Management, Shaanxi University of Science and Technology, Xi'an, China
Email: 781877506@qq.com

How to cite this paper: Yang, W. B., & Xue, J. (2026). Strategies for Enhancing the Competitiveness of L Seed Company from an Innovation Perspective. *Open Journal of Social Sciences, 14,* 56-64.
https://doi.org/10.4236/jss.2026.142005

Received: January 8, 2026
Accepted: January 29, 2026
Published: February 2, 2026

Abstract

Innovation has become a key driver for seed enterprises to build core competitiveness. Taking L Seed Company as a case study, this paper constructs a three-dimensional analytical framework—"technological innovation-variety innovation-model innovation"—based on innovation theory. It delves into core issues within the enterprise regarding innovation resource allocation, innovation outcome transformation, and innovation collaboration mechanisms. The study proposes targeted and feasible strategies for enhancing competitiveness, offering practical pathways for China's seed industry to achieve innovation-driven high-quality development.

Keywords

Innovation Perspective, Corporate Competitiveness, Enhancement Strategies, Seed Industry Innovation

1. Introduction

Currently, international seed industry giants dominate the global market through substantial innovation investments and well-established innovation systems (Dou et al., 2025). In recent years, L has actively expanded into cutting-edge fields such as biological breeding and intelligent breeding, yet continues to face challenges including insufficient innovation efficiency and delayed commercialization of research outcomes (Zhao, 2025). This paper adopts an innovation-oriented approach, analyzing the core components of corporate innovation capabilities based on L Seed Company's publicly available annual reports from 2020 to 2024, industry statistical reports, and authoritative research data. It proposes corresponding enhancement strategies aimed at driving L Seed Company's competitiveness up-

grade through innovation, while also providing valuable insights for the innovative development of similar seed enterprises in China.

2. Literature Review

The systemic and collaborative nature of seed industry innovation is a research hotspot (Yang, 2026). Scholars have found that the key to enterprises maintaining long-term dominance in the global market lies in establishing a full-chain innovation system encompassing "technology R&D-variety breeding-market conversion." By continuously increasing investment in cutting-edge technologies such as biotechnology breeding and intelligent breeding, they have formed high-barrier core technological advantages. Simultaneously, leveraging global innovation networks to integrate worldwide germplasm resources and talent resources enables the rapid commercialization of innovation outcomes (Wang et al., 2012).

With the deepening advancement of China's seed industry revitalization strategy, research related to seed industry innovation has shown rapid growth (He, 2022). Scholars generally agree that compared to international giants, Chinese seed enterprises still lag significantly in innovation investment intensity, core technology reserves, and efficiency of commercializing research outcomes (Zhang, 2023). There is insufficient attention to the alignment between technological innovation and market demand; research on crop variety innovation for economic crops remains relatively weak, making it difficult to support enterprises' diversification strategies (Sun et al., 2014). Systematic research on enhancing the efficiency of innovation resource allocation through mechanism design and overcoming bottlenecks in commercialization is scarce.

In summary, existing research predominantly focuses on the seed industry as a whole, with relatively few in-depth case studies examining the innovation practices of specific enterprises. Moreover, most studies employ single- or dual-dimensional analyses, making it difficult to comprehensively grasp the core components and enhancement pathways of seed enterprises' innovation competitiveness. Therefore, this paper adopts specific enterprises as its research subjects. Through an integrated study of the intrinsic relationships among "technology-variety-model," it analyzes and proposes enhancement strategies.

3. Analysis of L Seed Company's Innovation Competitiveness Status from 2020 to 2024

3.1. Current Status of Three-Dimensional Innovation and Development

1) Technological Innovation: Leading Investment Scale, Accelerated Deployment of Cutting-Edge Technologies

Analysis: Table 1 shows that, from 2020 to 2024, L Seed Company's R&D investment grew from RMB 521 million to RMB 693 million, representing a cumulative increase of 33.01%. The proportion of R&D expenditure to revenue rose from 7.56% to 8.09%, consistently exceeding the industry average (which stood at

6.2% in 2024). Regarding R&D team development, the number of core R&D personnel increased from 426 to 568, representing a cumulative growth of 33.33%. Among them, the proportion of personnel holding doctoral degrees or higher rose from 18% in 2020 to 25% in 2024. In 2024, the company filed 63 cutting-edge technology patent applications, a 125% increase from 2020. This includes 38 patents related to transgenic technology and 15 patents related to AI-assisted breeding, establishing a comprehensive portfolio of cutting-edge technology patents.

Table 1. Core technology innovation indicators for L seed company, 2020-2024.

Year	Research and Development Expenditure (in billions of yuan)	R&D expenditure as a percentage of revenue (%)	Number of Core R&D Personnel (persons)	Number of cutting-edge technology patent applications (units)
2020	5.21	7.56	426	28
2021	5.87	7.80	458	35
2022	6.35	7.73	492	42
2023	7.12	7.72	531	51
2024	6.93	8.09	568	63

2) Variety Innovation: Increased Number of Achievements, Prominent Advantages of High-Quality Varieties

Analysis: Table 2 shows that variety innovation achievements continue to emerge, with the number of newly approved varieties increasing from 18 to 32 between 2020 and 2024, representing a cumulative growth of 77.78%. The revenue share of high-quality varieties rose from 45% to 58%, with the hybrid rice varieties "A" and "B" each generating annual revenues exceeding 500 million yuan, becoming the company's core profit-generating varieties. Despite the 2024 market downturn, high-quality corn varieties "C" and "D" maintained stable market share. The first genetically modified corn variety entered commercial trials in 2022, with GM varieties reaching 6.8 million mu (447,000 hectares) in cultivation area by 2024—accounting for 30% of China's total GM corn planting. The variety iteration cycle shortened from 6.5 years to 4.5 years, 1.3 years faster than the industry average (5.8 years). However, high-quality corn varieties contributed only 42% of total revenue, lower than the 75% share from high-quality rice varieties. Newly approved varieties for economic crops like vegetables and cotton accounted for just 15% of total approved varieties, indicating insufficient alignment with the company's diversification strategy.

3) Model Innovation: Collaborative Mechanism Development, with Room for Improvement in Transformation Efficiency

Analysis: Table 3 shows that, in the field of model innovation, L Seed Company increased its collaborative projects between industry, academia, and research from 12 to 25, representing a cumulative growth of 108.33%. It has established long-term partnerships with over 20 research institutions and jointly built five biologi-

cal breeding laboratories. Through the contract farming model, the covered area expanded from 3.5 million mu to 7.8 million mu, achieving a cumulative growth of 122.86%, with contract farming revenue accounting for 35% of total revenue. The company built an integrated online platform for variety display, technical services, and contract sales, boosting the revenue share from digital promotion channels from 8% to 28%. However, the conversion rate of R&D achievements remains low with the R&D conversion rate declining from 66.67% in 2020 to 65.63% in 2024, falling below the industry-leading average (over 75%). Some newly approved varieties failed to achieve large-scale commercialization due to unclear market positioning and insufficient supporting promotion services. Additionally, overseas industry-academia-research collaboration projects numbered only three, accounting for 12% of total collaborations, insufficient to support innovation demands for international market expansion.

Table 2. Core indicators of variety innovation for L seed company, 2020-2024.

Year	Number of newly approved varieties (units)	Revenue Contribution from Premium Varieties (%)	Area of Transgenic Varieties Promoted (10,000 mu)	Variety Iteration Cycle (Years)
2020	18	45	0	6.5
2021	22	48	0	6.2
2022	25	52	120	5.8
2023	28	55	350	5.2
2024	32	58	680	4.5

Table 3. Core indicators of model innovation for L seed company, 2020-2024.

Year	Number of Industry-Academia-Research Collaboration Projects (units)	Conversion rate of R&D achievements (%)	Area Covered by Contract Farming (10,000 mu)	Digital Promotion Channels Revenue Share (%)
2020	12	66.67	350	8
2021	15	68.18	420	12
2022	18	68.00	510	16
2023	22	67.86	630	21
2024	25	65.63	780	28

3.2. Performance of Innovation Competitiveness Support Factors

1) Innovation Resources: Significant advantages in germplasm resources and hardware facilities. The company maintains over 100,000 germplasm accessions and has established three major R&D centers equipped with advanced facilities including gene sequencers and AI breeding platforms. In 2024, it received 120 million yuan in subsidies under the Seed Industry Revitalization Program. However, the precision utilization efficiency of germplasm resources remains low, with

only 30% of germplasm resources applied in large-scale breeding programs.

2) Innovation Talent Factors: The core R&D team includes 12 experts receiving special government allowances and 8 leading figures in the seed industry, with a preliminary talent pipeline established. However, shortcomings exist in talent incentive mechanisms, as equity incentive coverage for R&D personnel stands at only 25%, below the industry-leading average of 40%. This elevates the risk of losing high-end talent. Concurrently, recruitment and cultivation of international high-end talent remain insufficient, with overseas R&D teams comprising just 35 individuals—accounting for 6.16% of core R&D personnel.

3) Innovation Collaboration Factors: Domestically, the company has established a relatively comprehensive innovation collaboration network with research institutions and upstream/downstream enterprises, with collaborative innovation achievements accounting for 45% of total innovation outcomes in 2024. However, internationally, it has only engaged in technical cooperation with a few companies in Brazil and India, without establishing overseas R&D centers. Its capacity for integrating international innovation resources remains insufficient, making it difficult to respond swiftly to global technological transformation demands in the seed industry.

4) Innovation Policy Factors: Deeply engaged in national policy initiatives such as the pilot program for industrializing biological breeding and the seed industry revitalization campaign, benefiting from preferential policies including R&D expense super-deduction and intellectual property protection. In 2024, R&D expense super-deduction reached 210 million yuan. However, policy alignment requires improvement, utilization of policies supporting international innovation cooperation remains insufficient, and the overseas intellectual property protection system is yet to be fully developed.

4. Core Issues of L Seed Company's Competitiveness from an Innovation Perspective

1) Low efficiency in innovation commercialization: The conversion rate of R&D achievements stands at only 65.63%. The core reason lies in the absence of a coordinated mechanism between R&D and market operations. Some varieties exhibit poor compatibility between yield and quality, while others fail to meet regional cultivation demands in terms of stress tolerance. Support services in the promotion phase lag behind, lacking integrated "variety + technology + service" solutions, resulting in slow adoption by farmers. The assessment mechanism for technology transfer is inadequate, failing to incorporate market conversion outcomes into core evaluation metrics for R&D teams, leading to significant disconnect between research and market needs.

2) Insufficient support for diversified innovation: Variety innovation is concentrated in rice, with newly approved rice varieties accounting for 65% of all approved varieties. Innovation in categories such as corn and vegetables lags behind, with high-quality corn varieties contributing only 42% of revenue and vegetable

variety innovation contributing less than 5%—a mismatch with the company's diversified development strategy. Technological innovation focuses on cutting-edge fields like GMOs and AI breeding, yet basic research investment remains inadequate. R&D expenditure accounts for only 15% of total investment, below the industry average of 25%.

3) Lagging Innovation Incentives and Talent Development: Equity incentives cover only 25% of R&D personnel, while compensation incentives are loosely tied to innovation outcomes, dampening R&D staff's motivation for innovation. Specialized development programs for high-end innovation talent are lacking, resulting in delayed talent pipeline construction—young R&D personnel account for just 30% of the workforce. Insufficient recruitment and cultivation of international high-end talent, coupled with small overseas R&D teams, place the company at a disadvantage in the global competition for seed industry talent.

4) Weak international innovation collaboration: Overseas industry-academia-research cooperation projects account for only 12% of the total project portfolio. No overseas R&D centers have been established, and the capacity to integrate international innovation resources remains limited. The overseas intellectual property protection system is inadequate, with patents filed in 15 countries but granted in only 8. Additionally, insufficient adaptation of varieties to different countries' conditions persists. Most varieties promoted overseas are direct imports of domestic varieties, exhibiting poor regional adaptability and hindering the realization of innovation value in international markets.

5) Germplasm utilization rate stands at only 30%, with vast quantities of high-quality germplasm resources remaining underdeveloped; R&D investment suffers from a "quantity over quality" approach. In 2024, 12 R&D projects failed due to unclear objectives and unreasonable technical approaches, resulting in an 18% waste rate of R&D investment. Concurrently, innovation resources are excessively skewed toward high-risk, long-cycle projects, while insufficient investment is directed toward variety improvement projects yielding short-term results. This misalignment between innovation resource allocation and market demand persists.

5. Innovation-Driven Strategy for Enhancing Competitiveness

5.1. Enhance the Technology Transfer System

Establish a market demand research system at the front end, forming a variety approval committee comprising R&D personnel, marketing specialists, and farmer representatives to ensure newly approved varieties precisely align with market needs. During promotion, develop integrated solutions combining "varieties + technical guidance + post-harvest services," offering planting training and field management guidance to boost farmer adoption. Increase the technology transfer rate of R&D outcomes to over 75%. Optimize the evaluation and incentive mechanisms for technology transfer. Incorporate commercialization metrics such as revenue and market share into R&D team evaluations, with a minimum weighting of

40%. Establish a dedicated achievement conversion bonus, rewarding R&D teams with 1% - 2% of commercial revenue for outstanding commercial outcomes.

5.2. Optimize Innovation Structure

Increase investment in corn and vegetable innovation, raising corn R&D allocation from 35% to 45% and vegetable R&D allocation from 8% to 15%. Establish joint laboratories with leading vegetable research institutions to increase vegetable variety revenue share to over 12%. Optimize corn variety structure by promoting specialized varieties like silage corn and high-oil corn, raising premium corn variety revenue share to over 60%. Increase basic research allocation to 25% of R&D investment, focusing on germplasm innovation and gene editing fundamentals to lay groundwork for breakthrough technologies.

5.3. Upgrade the Talent Incentive System

Implement the "Core Talent Equity Plan," offering personalized incentives through tailored strategies for international high-end talent and seed industry leaders. Establish an "Innovation Talent Special Fund" to continuously increase funding for R&D personnel training, advanced studies, and innovation projects. Create a fault-tolerance mechanism for R&D staff to stimulate innovation enthusiasm. Implement the "International Talent Recruitment Program" to attract 5-8 top global seed industry experts annually, establishing talent workstations. Collaborate with renowned agricultural universities to build a "Seed Industry Innovation Talent Training Base," cultivating over 50 young R&D talents. Construct a three-tier talent pipeline of "Leading Talents - Core Talents - Young Talents" to ensure the stability and growth of the innovation workforce.

5.4. Build a Global Innovation Network

Collaborate with international seed industry giants to establish joint bio-breeding laboratories, expanding the scale of international industry-academia-research partnerships to increase the proportion of international cooperation projects to over 30%. Form an international intellectual property (IP) team to develop differentiated patent application strategies tailored to each country's IP policies, achieving over 80% patent authorization coverage in international markets. Establish a variety infringement early warning mechanism to safeguard the value of innovations in international markets. Simultaneously, advance localized variety innovation by conducting targeted variety improvements based on regional climate and soil conditions to enhance the adaptability of overseas varieties.

5.5. Optimize the Allocation of Innovation Resources

Construct a "Digital Germplasm Resource Management Platform" to perform gene sequencing and trait annotation on germplasm resources, establishing a germplasm database. Utilize AI technology to screen high-quality germplasm resources, increasing germplasm resource utilization to over 60%. Collaborate with

research institutions to establish a germplasm resource sharing platform, achieving complementary resource utilization. Implement a project approval review mechanism for innovation initiatives, incorporating external experts to assess feasibility and reduce project failure rates. Promptly adjust or terminate projects with slow progress or poor outcomes to optimize resource allocation. Establish an innovation resource sharing mechanism, opening R&D equipment, laboratories, and other resources to internal teams and partner institutions to enhance resource utilization efficiency.

6. Concluding Remarks

Overall, from 2020 to 2024, L Seed Company has achieved remarkable results in innovation. It has established core strengths in technological innovation investment, variety innovation achievements, and domestic collaborative innovation. Breakthroughs have been made in areas such as the promotion of genetically modified varieties and the application of intelligent breeding technologies, laying a solid foundation for enhancing the company's competitiveness. However, the company still faces prominent challenges, including low efficiency in commercializing innovation outcomes, an imbalanced innovation structure, lagging talent incentives, and weak international innovation collaboration. These shortcomings persist in the global seed industry innovation competition.

Moving forward, a multidimensional strategy combining "improved commercialization systems + optimized innovation structure + upgraded talent incentives + global innovation network building + enhanced resource allocation efficiency" can effectively boost the company's innovation capabilities. This approach will transform technological and resource advantages into sustained market competitiveness and industry leadership. Moreover, L Seed Company's innovation practices offer crucial insights for China's seed enterprises: companies must establish a tripartite innovation system integrating "technology-variety-model" tailored to industry characteristics, strengthen resource integration and collaboration, and drive variety upgrades, technological breakthroughs, and model optimization through innovation. Only then can they consolidate their core position in fierce global competition and contribute significantly to national seed security and agricultural modernization.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Dou, Y. J., Qu, C. P., Song, M., & Wang, X. J. (2025). Evaluation and Convergence Analysis of Global Seed Industry Competitiveness. *Xinjiang Agricultural Reclamation Economy, No. 10,* 1-13.

He, X. T. (2022). *Competitiveness Evaluation of Listed Seed Companies.* Anhui Agricultural University.

Sun, Y. P., Wang, M. Q., Xu, P. et al. (2014). Evaluation of Seed Industry Competitiveness in Zhejiang Province and Strategies for Enhancement. *Zhejiang Agricultural Sciences, No. 3,* 305-311.

Wang, B. L., Song, Y. H., Yuan, Z. K., Chen, X., Wang, L. H., & Zhou, F. (2012). Strengthening Agricultural Technological Innovation and Transformation to Promote the Application of High-Quality Eggplant Varieties. *Journal of Science and Technology Innovation, No. 22,* 147.

Yang, X. C. (2026). Research on Legal Protection Mechanisms for Seed Intellectual Property Rights Aimed at Seed Industry Innovation. *Molecular Plant Breeding, 24,* 293-299.

Zhang, Z. Y. (2023). Research on Technological Innovation Efficiency of Seed Enterprises from an Innovation Value Chain Perspective. *Shanghai Business, No. 9,* 226-229.

Zhao, P. Q. (2025). *Research on Financial Risk Management of Longping High-Tech*. Master's Thesis, Shenyang University.