



AGRI MAGAZINE

(International E-Magazine for Agricultural Articles)

Volume: 03, Issue: 06 (June, 2026)

Available online at <http://www.agrimagazine.in>

© Agri Magazine, ISSN: 3048-8656

Guardians of Purity: Quality Assurance in Wheat Seed Production

*Rajesh Kumar¹, Dhani Ram Maurya², Priyank¹, Nilay Raj¹,
Mahendra Singh¹ and Pawandeep Singh¹

¹Executive Quality Assurance, Star Agriseeds Pvt Ltd, Sangaria (RJ), India

²Manager - Quality Assurance, Star Agriseeds Pvt Ltd, Sangaria (RJ), India

*Corresponding Author's email: rjghasolia343@gmail.com

Quality assurance plays a crucial role in wheat seed production because seed quality directly influences crop establishment, productivity and food security. During the last wheat production season, environmental fluctuations, disease pressure and post-harvest challenges highlighted the importance of maintaining strict quality standards throughout the seed production chain. The present article discusses the role of quality assurance practices adopted during the recent season in preserving genetic purity, seed vigour, physical purity and storage stability of wheat seeds. Field inspections, rouging operations, laboratory testing and moisture management significantly improved seed quality and market acceptability. The study emphasizes that effective quality assurance systems are essential for sustainable wheat seed production and farmer confidence.

Introduction

Wheat is one of the most important cereal crops cultivated worldwide and serves as a staple food for millions of people. In India, wheat contributes significantly to food security and agricultural income. The success of wheat cultivation largely depends on the availability of high-quality seeds capable of producing healthy and productive crops. Seed quality determines germination percentage, crop vigour, disease resistance and yield potential. Therefore, quality assurance has become an integral part of modern wheat seed production systems. It involves maintaining quality standards during seed multiplication, processing, storage, certification and distribution. During the last season, wheat seed production programs experienced several challenges such as irregular weather conditions, increased humidity, fungal diseases and storage-related issues. However, quality assurance measures played a significant role in maintaining seed standards and ensuring reliable seed supply to farmers.

Objectives of Quality Assurance in Wheat Seed Production

The major objectives of quality assurance during the last wheat seed production season were:

- To maintain genetic and physical purity of wheat seed lots
- To improve seed germination and vigour
- To minimize contamination and disease incidence
- To ensure safe storage and transportation
- To strengthen farmer confidence in certified and TL seeds
- To improve overall seed productivity and market quality

Role of Quality Assurance

Selection of Quality Seed Source

The foundation of quality wheat seed production begins with the use of breeder and foundation seeds obtained from certified sources. During the last season, only genetically

pure and recommended varieties were selected for seed multiplication programs. Proper seed source verification ensured varietal authenticity and purity.

Maintenance of Genetic Purity

Maintaining genetic purity was one of the primary responsibilities of quality assurance teams during the season. Recommended isolation distances were maintained to avoid contamination from nearby wheat crops. Regular rouging operations were carried out during vegetative, flowering and pre-harvest stages to remove off-type and diseased plants. Field inspections conducted by technical experts (QA team) ensured that seed production plots maintained varietal identity and uniform crop growth.

Scientific Crop Management

Scientific agronomic practices played an important role in maintaining wheat seed quality. Timely sowing, balanced fertilizer application, proper irrigation scheduling and weed management improved crop health and seed development. Integrated disease and pest management practices were also followed to reduce crop damage and maintain healthy seed production fields.

Field Inspection and Monitoring

Regular field inspections were conducted throughout the crop season to observe:

- Crop uniformity
- Isolation standards
- Disease and pest incidence
- Off-type plant population
- Overall crop condition

These inspections helped identify problems at early stages and allowed timely corrective measures to maintain quality standards.



Seed Processing and Quality Testing

After harvesting, wheat seeds were cleaned, graded and processed carefully to avoid mechanical injury. Broken, undersized and contaminated seeds were removed during grading operations. Seed samples were tested in NABL accredited laboratory for important quality parameters such as:

- Germination percentage
- Physical purity
- Moisture content
- Seed vigour
- Seed health

Only seed lots meeting certification standards were approved for packaging and distribution.

Moisture Management and Storage

Storage management became highly important because fluctuating humidity levels increased the risk of fungal infection and seed deterioration. Seeds were dried to safe moisture levels before storage to preserve viability and vigour. Scientific storage facilities with proper ventilation and regular monitoring protected seed lots from insects, rodents and moisture damage. Proper packaging materials further improved storage life and transportation safety.

Challenges Faced During the Last Season

Several environmental and operational challenges affected wheat seed production during the season:

- Irregular temperature fluctuations
- Unexpected rainfall during harvesting
- Increased fungal disease incidence

Despite these difficulties, strict quality assurance measures helped maintain acceptable seed standards and minimized losses.



Achievements

Maintained high genetic purity in wheat seed production plots through effective field inspections and rouging operations.

- Reduced contamination from off-type plants, weed seeds and diseased grains through regular monitoring and quality control measures.
- Successful implementation of proper isolation distance and field standards ensured varietal purity and certification quality.
- Laboratory testing ensured that only quality-certified wheat seed lots were approved for distribution to farmers.
- Better disease and pest management practices helped maintain healthy seed production fields throughout the season.
- Improved farmer confidence and satisfaction due to the availability of reliable and high-performing certified wheat seeds.
- Strengthened coordination between seed producers, quality assurance teams and production teams for maintaining production standards.
- Increased awareness among seed growers regarding scientific seed production and quality assurance practices.
- Established a stronger foundation for future wheat seed production programs through improved quality management systems.

Future Perspectives

Future wheat seed production systems should focus on:

- Advanced seed testing technologies
- Climate-resilient seed production practices
- Digital traceability systems
- Continuous training programs for seed growers and technical staff

Strengthening these areas will improve seed reliability and support sustainable agricultural development.

Conclusion

The last wheat seed production season clearly demonstrated the crucial role of quality assurance in maintaining seed standards and ensuring successful agricultural production. Scientific crop management, regular inspections, laboratory testing, efficient processing and proper storage practices proved essential for preserving wheat seed quality under challenging environmental conditions. Quality assurance not only improves seed performance and crop productivity but also strengthens farmer confidence, market acceptance and national food security systems. Continuous improvement in quality management practices and adoption of modern technologies will remain essential for achieving sustainable wheat seed production in the future.

References

1. Indian Council of Agricultural Research (2021). *Seed Production Technologies of Agricultural Crops*. ICAR Publications, New Delhi.
2. Indian Agricultural Research Institute (2022). *Advances in Wheat Seed Production and Quality Management*. Division of Seed Science and Technology, IARI.
3. Tunwar, N.S. and Singh, S.V. (2019). *Indian Minimum Seed Certification Standards*. Central Seed Certification Board, Government of India.
4. Agarwal, R.L. (2018). *Seed Technology*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Chaudhary Charan Singh Haryana Agricultural University (2023). *Seed Production and Quality Assurance Manual for Wheat*.
6. Yadav, O.P. and Kumar, A. (2021). Role of seed certification in maintaining genetic purity of wheat varieties. *Journal of Cereal Research*, 13(1): 45–53.

7. ISTA (2024). *International Rules for Seed Testing*. International Seed Testing Association, Switzerland.
8. Meena, P.K., Verma, S. and Choudhary, R. (2023). Scientific storage management for maintaining wheat seed viability under Indian conditions. *Agricultural Reviews*, 44(3): 201–208.
9. National Seed Corporation (2022). *Guidelines for Certified Wheat Seed Production and Processing*.
10. Kumar, S. and Singh, D. (2024). Modern quality assurance approaches in wheat seed production systems. *Indian Journal of Agricultural Research*, 58(2): 155–163.
11. Department of Agriculture and Farmers Welfare (2023). *Quality Control Measures in Seed Production Systems*. Government Publication.