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October 2025

Agronomic Evaluation and Performance Analysis of New Varieties of Cereals and Pulses Under Field Conditions

Digital Agri News e-Magazine
Volume 01 || Issue 04

Agronomic Evaluation and Performance Analysis of New Varieties of Cereals and Pulses Under Field Conditions

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Introduction

Cereals and pulses form the backbone of India's food and nutritional security. Rice, wheat, and maize feed millions daily, while pulses are the primary source of protein for a largely vegetarian population. Yet, farming these crops is becoming more challenging due to climate change, declining soil fertility, and rising pest and disease attacks. To overcome these hurdles, scientists are continuously developing new high-yielding, disease-resistant, and climate-resilient varieties. But before reaching farmers' fields, these varieties undergo detailed agronomic evaluation—a process to test how well they adapt and perform under real farming conditions.

Why New Varieties Matter

New crop varieties are more than just alternatives to old seeds. They bring hope for better yields, improved nutrition, and resilience against stress.

- **Cereals :** Modern varieties offer rust resistance in wheat, blast tolerance in rice, and enhanced nutritional quality in maize.
- **Pulses :** Improved chickpea, pigeonpea, and lentil varieties show shorter maturity, better resistance to wilt and root rot, and tolerance to drought and heat.

Such advancements can help India achieve food security while supporting farmers' incomes.

Field-Level Performance

Recent evaluations have identified several promising varieties across cereals and pulses.

- **Wheat (HD 3226) :** High-yielding (65–70 q/ha), resistant to yellow and brown rust, and suitable for timely sowing in north-western plains.
- **Rice (DRR Dhan 44) :** Early-maturing, performs well in rainfed lowlands, with moderate resistance to blast and bacterial blight.
- **Maize (HQPM-5):** Known for quality protein content (lysine and tryptophan), drought tolerance, and yields of 60–65 q/ha.
- **Chickpea (JG 14):** Early maturing, wilt-resistant, yielding 20–25 q/ha.
- **Pigeonpea (ICPL 87119 - Asha):** Resistant to sterility mosaic and wilt, with yields up to 22q/ha
- **Lentil (IPL 316):** Bold seeds, disease tolerance, and higher water-use efficiency.

These varieties combine yield potential with resilience, making them ideal for different agro-climatic zones.

Factors That Shape Crop Performance

Performance in the field depends on multiple factors:-

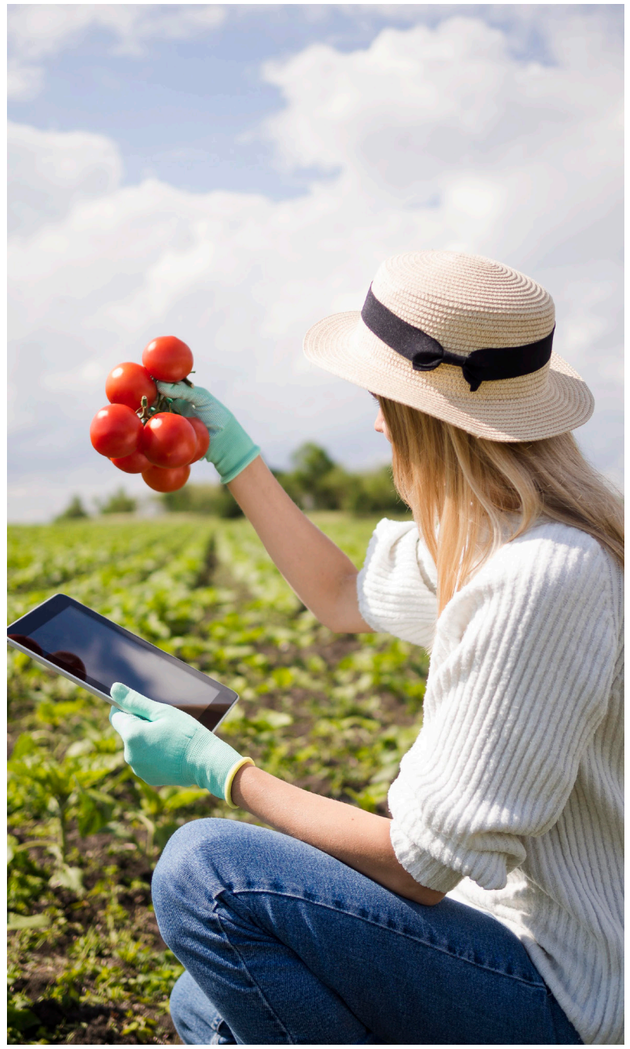
- **Soil type and fertility:** Loamy soils suit cereals, while pulses thrive in sandy loams.
- **Climate:** Temperature and rainfall directly impact flowering and grain filling.
- **Pest and disease pressure:** Resistant varieties ensure stable yields.
- **Farm management practices:** Timely sowing, balanced fertilizer use, and water management are crucial.

This highlights the importance of matching the right variety with the right environment.

Lessons from the Field

Agronomic evaluations have shown encouraging results:

- Wheat variety HD 3226 consistently outperformed existing varieties in terms of yield and disease resistance.
- Rice variety DRR Dhan 44 proved adaptable in eastern zones with limited irrigation.
- Maize hybrid HQPM-5 stood out not only for its yield but also for its nutritional value.
- Pulses like JG 14 (chickpea) and ICPL 87119 (pigeonpea) showed resilience to drought and disease, making them reliable for rainfed farming.



Such findings give farmers practical options that balance productivity and sustainability.

Future Prospects and Recommendations

For widespread success, it is important that:-

- Farmers choose varieties based on regional suitability.
- Agronomic packages and best practices are shared through extension services.
- Seed production and distribution systems are strengthened.
- Feedback loops are created between farmers and researchers to fine-tune technologies.

Conclusion

The evaluation of new cereal and pulse varieties is not just a scientific exercise—it is a pathway to secure India's food future. By adopting varieties that are productive, resilient, and adaptable, farmers can reduce risks, improve incomes, and contribute to sustainable agriculture. With collaboration between breeders, agronomists, policymakers, and farmers, these improved varieties will play a vital role in shaping the next phase of Indian agriculture.

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