SOIL HEALTH CARD AND FERTILITY ANALYSIS REPORT

Department of Agriculture & Farmers Welfare
Government of Haryana
Soil Testing Laboratory, Rohtak Division

Document Information

Field	Details
Report Reference Number	SHCR/RHK/2025/HR-0478256
Report Date	November 23, 2025
Laboratory Accreditation	NABL Certified ISO/IEC 17025:2017
Report Validity	3 Years from Date of Issue
Testing Standard	IARI STFR (Soil Test & Fertilizer Recommendation) Protocol

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FARMER AND LAND DETAILS

Field	Information
Farmer Name	Mr. Rajveer Singh Yadav
Father's Name	Late Baldev Singh Yadav
Contact Number	+91-9876543210
Village	Sahibabad
Block	Sonipat
District	Sonipat, Haryana
State	Haryana
GPS Coordinates	N 28°56'34.5" E 77°02'18.7"
Land Area	2.50 hectares (6.17 acres)
Soil Type	Clay Loam
Current Cropping Pattern	Rice-Wheat System
Previous Crop	Basmati Rice (Harvested: October 2025)
Planned Crop	Wheat (to be sown: December 2025)
Soil Sample Depth	0-15 cm (Plow Layer)
Sample Collection Date	November 18, 2025
Collection Method	Random Composite Sampling (15 sub-samples)

SOIL ANALYSIS RESULTS

Chemical Parameters (Macro-nutrients)

Parameter	Test Result	Standard Range	Status
Nitrogen (N) - Available	168 kg/ha	280-560 kg/ha	Low
Phosphorus (P) - Available	24.5 kg/ha	22-40 kg/ha	Medium
Potassium (K) - Available	412 kg/ha	180-350 kg/ha	High

Secondary Nutrient

Parameter	Test Result	Standard Range	Status
Sulphur (S) - Available	18.2 mg/kg	15-20 mg/kg	Medium

Micronutrients (Trace Elements)

Nutrient	Test Result	Critical Level	Status
Zinc (Zn)	0.92 mg/kg	> 0.6 mg/kg	Adequate
Iron (Fe)	8.45 mg/kg	> 2.5 mg/kg	Adequate
Copper (Cu)	1.34 mg/kg	> 0.2 mg/kg	Adequate
Manganese (Mn)	6.78 mg/kg	> 1.0 mg/kg	Adequate
Boron (B)	0.48 mg/kg	> 0.5 mg/kg	Marginal

Physical Parameters

Parameter	Test Result	Interpretation
pH (Soil Acidity/Alkalinity)	7.85	Neutral to Slightly Alkaline
Electrical Conductivity (EC)	0.68 dS/m	Non-Saline
Organic Carbon (OC)	0.62%	Low
Bulk Density	1.38 Mg/m^3	Normal for Clay Loam
Water Holding Capacity	32.4%	Good for Clay Loam
Texture Classification	Clay Loam	Balanced Sand-Silt-Clay Ratio

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SOIL HEALTH INDEX (SHI)

Overall Soil Health Index Score: 2.24/3.0

Classification: MEDIUM

The soil demonstrates medium health status characterized by balanced physical properties but requiring nutrient supplementation, particularly nitrogen.

Index Components:

- Chemical Health Index: 1.95 (Low nitrogen counterbalanced by adequate P and high K)
- Physical Health Index: 2.68 (Good structure and water retention capacity)
- Biological Health Index: 2.18 (Estimated from organic carbon and soil respiration assessments)

INTERPRETATION AND SOIL CONDITION ASSESSMENT

Strengths of Your Soil

1. **Good Texture Balance:** The clay loam composition (35% clay, 45% silt, 20% sand) provides good water holding capacity while maintaining adequate drainage for cereal crops like wheat.
2. **Optimal pH Level:** The pH of 7.85 is ideal for most crops grown in Haryana, particularly wheat, allowing nutrient availability and minimal toxicity concerns.
3. **Adequate Potassium:** High K content (412 kg/ha) supports crop growth, yield quality, and disease resistance, which is essential for wheat productivity.
4. **Micronutrient Status:** Adequate levels of Zn, Fe, Cu, and Mn ensure normal plant metabolism and grain quality.
5. **Non-Saline Condition:** EC of 0.68 dS/m indicates no salinity stress, permitting normal water uptake and nutrient absorption by crops.

Areas of Concern

1. **Low Nitrogen:** Available nitrogen of 168 kg/ha is significantly below the optimal range (280-560 kg/ha). This is a critical limiting factor for wheat yield and will require nitrogen supplementation.
2. **Low Organic Carbon:** At 0.62%, organic matter is below ideal levels (0.75-1.25% for clay loam). This affects soil structure stability, water retention, and biological activity. Intensive rice-wheat cropping without adequate organic amendment has depleted soil carbon.
3. **Marginal Boron:** Boron status at 0.48 mg/kg is just below the critical level. While not deficient, continuous cropping may lead to deficiency, particularly in pulses and oilseeds.

RECOMMENDATIONS FOR NUTRIENT MANAGEMENT

Fertilizer Application for Wheat (Planned Crop - December 2025)

Based on the test results and STFR protocol, following fertilizer doses are recommended:

Recommended NPK Dose for Wheat:

Nutrient	Recommended Dose (kg/ha)	Fertilizer Type	Application Timing
Nitrogen (N)	120-140	Urea / Ammonium Nitrate	Split: 60 kg/ha at sowing + 60-80 kg/ha at CRI*
Phosphorus (P)	60	Single Superphosphate (SSP) / DAP	At sowing
Potassium (K)	40	Muriate of Potash (MOP)	At sowing
Boron (B)	1.0	Borax Powder	Foliar spray at tillering stage

*CRI = Crown Root Initiation stage (approximately 3-4 weeks after sowing)

Integrated Nutrient Management (INM) Strategy:

To address organic carbon deficiency and improve long-term soil health, the following organic amendments are recommended alongside chemical fertilizers:

- **Farm Yard Manure (FYM):** Apply 8-10 tons/ha during field preparation (November 2025) to improve organic carbon and soil structure.
- **Green Manuring:** Consider cultivating legume crops (Sesbania or Dhaincha) as green manure during monsoon 2026 prior to rice crop, which will enhance nitrogen availability and organic matter.
- **Crop Residue Management:** Retain 30-40% of rice straw mulch on field surface to improve organic carbon accumulation and moisture retention.
- **Bio-fertilizers:** Apply Azospirillum (nitrogen-fixing bacterium) at 2-5 kg/ha to supplement available nitrogen and reduce fertilizer dependency.

Micronutrient Management Plan

Boron Application (Recommended):

- Method: Foliar spray of 0.5% Borax solution (500 g Borax dissolved in 100 L water)
- Timing: At tillering stage of wheat (25-30 days after sowing)
- Benefit: Improves grain development and prevents boron-related disorders

Other Micronutrients (Optional):
Zinc and Iron are currently adequate. However, if visual deficiency symptoms appear during crop growth (chlorotic leaves, stunted growth), apply:

- Zinc Sulphate: 25 kg/ha mixed with FYM before sowing, or 2% foliar spray at boot stage
- Iron Chelate: 0.5% foliar spray if interveinal chlorosis observed

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CROP SUITABILITY AND ADVISORY

Recommended Crops for Your Soil

Based on soil texture, pH, fertility status, and climatic suitability for Haryana region:

Crop	Suitability	Recommended Season
Wheat	Highly Suitable	Rabi (Dec-April)
Barley	Suitable	Rabi
Rice (Basmati/Hybrid)	Suitable	Kharif (June-Oct)
Mustard	Suitable	Rabi
Chickpea	Suitable	Rabi
Sugarcane	Moderate	Annual
Maize	Suitable	Kharif
Potato	Suitable	Rabi
Carrot/Radish	Suitable	Rabi/Winter
Okra	Moderate	Kharif

Crops to Avoid or Use with Caution

- **Pulses (Gram, Moong):** While suitable, require micronutrient fortification due to marginal boron status
- **Sunflower:** Possible if boron deficiency is managed through amendments

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SOIL MANAGEMENT RECOMMENDATIONS

Short-term Actions (Next 3-6 months)

1. **Apply FYM:** Incorporate 8-10 tons/ha well-decomposed farm yard manure immediately before wheat sowing to enhance organic carbon and improve soil structure.
2. **Nitrogen Management:** Apply recommended nitrogen dose in two splits (sowing + CRI stage) using Urea or ammonium nitrate to optimize nitrogen use efficiency and reduce losses.
3. **Micronutrient Spraying:** Plan foliar application of Borax solution at wheat tillering stage (ensure timely execution).
4. **Mulching:** Retain rice straw residue on field surface to conserve soil moisture and add organic matter over time.

Medium-term Actions (6-12 months)

1. **Residue-based Composting:** Collect and compost crop residues with legume material to create nutrient-rich organic manure for future crops.
2. **Legume Incorporation:** Allocate portion of field for green manuring with Sesbania during monsoon 2026 (pre-rice preparation) to fix atmospheric nitrogen and increase organic carbon.
3. **Soil pH Monitoring:** If pH increases beyond 8.2 in future tests, apply Gypsum at 2-5 tons/ha to manage alkalinity without disturbing pH drastically.
4. **Re-sampling Schedule:** Plan soil testing after rice harvest (October 2026) to monitor nutrient dynamics and adjust future management practices accordingly.

Long-term Soil Health Strategy (12-36 months)

1. **Organic Carbon Building:** Target organic carbon level of 0.9-1.2% through consistent FYM application, crop residue incorporation, and green manuring cycles.
2. **Conservation Agriculture:** Transition to zero-tillage wheat cultivation after rice to reduce soil disturbance, conserve moisture, and retain organic matter.
3. **Balanced Nutrient Cycling:** Implement precision agriculture with soil test-based fertilizer application every 3 years to optimize inputs and maintain nutrient balance.
4. **Crop Diversification:** Introduce legumes in crop rotation (e.g., Rice-Wheat-Legume system) to reduce external nitrogen requirement and enhance soil health through biological nitrogen fixation.
5. **Soil Health Card Renewal:** Obtain new Soil Health Card every 3 years (next testing due: November 2028) to track improvements and adjust management accordingly.

COST ESTIMATE FOR RECOMMENDED INPUTS

Input	Quantity/ha	Unit Cost (₹)	For 2.5 ha (₹)	Remarks
Urea (120 kg total)	260 kg	7.50/kg	4,875	Split application
SSP (60 kg P)	400 kg	15.00/kg	15,000	At sowing
MOP (40 kg K)	70 kg	22.00/kg	3,850	At sowing
Farm Yard Manure	8-10 tons	150/quintal	37,500	Transport included
Borax (Boron source)	5 kg	80/kg	1,000	Foliar spray
Azospirillum (Bio-fert)	2.5 kg	400/kg	2,500	For nitrogen fixation
Labor (Application)	-	-	5,000	Field operations
TOTAL ESTIMATED COST			**₹69,725**	**Per 2.5 hectares**

Average Cost per Hectare: ₹27,890 (Includes all recommended inputs and labor for application)

EXPECTED OUTCOMES AND YIELD PROJECTIONS

Based on proper implementation of fertilizer recommendations and soil management practices:

Wheat Crop (Expected for 2025-26):

- **Expected Grain Yield:** 45-52 quintals/hectare (normal potential for clay loam soil with recommended inputs)
- **Straw Yield:** 55-60 quintals/hectare
- **Protein Content:** 11.5-12.2% (enhanced through balanced nitrogen management)
- **Key Success Factor:** Timely and proper nitrogen application + Boron micronutrient spray

Improvements Expected Over 3 Years:

Following integrated nutrient management strategy:

- Nitrogen availability: 168 kg/ha → 240-280 kg/ha (estimated)
- Organic Carbon: 0.62% → 0.85-0.95% (through FYM and green manuring)
- Soil Health Index: 2.24 → 2.50-2.75 (improved physical and biological health)
- Crop yield stability: Better and more consistent yields with reduced input risks

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IMPORTANT NOTES AND DISCLAIMERS

1. This report is based on soil sample collected from 0-15 cm plow layer. Deeper layers or other areas of the field may show variation.
2. Fertilizer recommendations are for wheat crop under standard rainfed/canal irrigation conditions. Adjust doses based on actual water availability and crop condition during growing season.
3. The values presented are valid for a period of 3 years from the date of issue. Soil conditions may change due to weather, cropping intensity, and external inputs.
4. Recommendations are based on IARI-STFR protocol and current best practices for Haryana agriculture. Local Krishi Vigyan Kendra (KVK) should be consulted for crop-specific guidance.
5. Micronutrient recommendations are based on test results. Visual symptoms during crop growth may necessitate additional applications.
6. Farmers are advised to follow Integrated Pest Management (IPM) and disease management practices as per Department of Agriculture guidelines for comprehensive crop protection.
7. This report should be retained for record purposes and referenced during future soil testing cycles.

LABORATORY DETAILS AND CERTIFICATION

Analyzed by:
Dr. Ramesh Kumar Sharma
Senior Soil Analyst
M.Sc. (Soil Science) - IARI, New Delhi
Registration: HAR-ST-2847

Verified by:
Dr. Neha Verma
Laboratory In-Charge
Ph.D. (Soil Chemistry) - CCSHAU, Hisar
Registration: HAR-ST-2651

Laboratory Details:

- Department of Agriculture & Farmers Welfare, Government of Haryana
- Soil Testing Laboratory, Rohtak Division
- Address: Agricultural Research Station, Rohtak-124001, Haryana
- Phone: +91-1262-246890 | Email: soiltesting.rohtak@agriharyana.gov.in
- NABL Accreditation: HAR/TL/0542 (Valid until: December 2026)
- ISO/IEC 17025:2017 Certified

Testing Equipment Used:

- IARI STFR Digital Soil Testing Machine (Calibrated: October 2025)
- pH Meter: Calibrated with buffers 4.0, 7.0, and 9.0
- Conductivity Meter: Calibrated with standard solutions
- Flame Photometer: Used for Potassium estimation
- UV-Visible Spectrophotometer: For phosphorus and micronutrients
- Kjeldahl Apparatus: For nitrogen determination

CONTACT AND SUPPORT SERVICES

For Further Clarification:

- Contact Agricultural Extension Officer, Sonipat Block
- Phone: +91-1302-229456
- Email: extension.sonipat@haryana.gov.in

Free Farmer Advisory Services:

- Krishi Vigyan Kendra (KVK), Sonipat - Website: www.kvksonipat.org
- Plant Clinic at nearest Cooperative Society - Available on specific days each week

Subsidized Input Distribution:

- Contact: Haryana Farmer Welfare Commission
- Agricultural Input Subsidy Scheme - Under PM-KISAN, GoI

SIGNATURE AND CERTIFICATION

I hereby certify that this soil sample has been analyzed according to the standard procedures prescribed by the Indian Council of Agricultural Research (IARI), Government of India, and the results presented are accurate as per our laboratory records.

Laboratory Seal and Registration:

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│ NABL CERTIFIED LABORATORY │
│ HAR/TL/0542 │
│ ISO/IEC 17025:2017 │
│ Department of Agriculture │
│ Govt. of Haryana │
│ Soil Testing Laboratory, Rohtak │
│ Valid until: Dec 2026 │
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Date of Report Issue: 23 November 2025
Report Validity Period: 23 November 2025 to 22 November 2028

This Soil Health Card is the property of the farmer. It is recommended to keep this report safely for farm records and future reference.

For Digital Verification: Visit portal.haryana.gov.in/soil-health-card and enter Reference Number: SHCR/RHK/2025/HR-0478256

APPENDIX: GLOSSARY OF TERMS

Available Nutrients: Nutrients in form that plants can readily absorb and utilize.

Bulk Density: Mass of soil solids per unit volume; indicates soil compaction and aeration status.

Electrical Conductivity (EC): Measure of salt content; higher EC indicates salinity problems.

Organic Carbon: Carbon content from decayed plant and animal matter; indicates soil health and fertility.

pH: Measure of soil acidity or alkalinity (0-14 scale; 7 is neutral).

STFR: Soil Test and Fertilizer Recommendation - standardized protocol for soil testing in India.

Micronutrients: Essential trace elements (Zn, Fe, Cu, Mn, B) required in small quantities.

Macronutrients: Primary nutrients (N, P, K) required in large quantities for plant growth.

End of Report