

Agricultural Knowledge Base

Source: Compiled for AI-based Digital Financial Literacy Project

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This document consolidates crucial agricultural knowledge for ingestion into a Retrieval-Augmented Generation (RAG) pipeline. It includes guidelines, statistics, and case studies on crop practices, pest control, market trends, and government schemes.

1. Weather Data and Advisory

- Region-wise Weather Patterns:
 - Maharashtra (2015–2020): Avg. Rainfall – 890 mm/year; Avg. Temp – 28°C; Humidity – 65%
 - Punjab: Avg. Rainfall – 1,050 mm/year; mostly during monsoon season.
- Official Forecasts:
 - IMD Monsoon Alert (July 2025): Above normal rainfall in Eastern India.
 - AgroMet Advisory: Delay transplanting of rice in flood-prone regions.
- Weather Impact on Crops:
 - Drought in Karnataka (2019) reduced ragi yield by 30%.
 - Flooding in Assam (2022) damaged 18% of paddy crops. Response: Shift to short-duration paddy.

2. Crop Selection and Best Practices

- Seasonal Crop Calendar (North India):
 - Kharif: June–October – Rice, Maize, Cotton
 - Rabi: November–March – Wheat, Mustard, Chickpea
- Cultivation Guide (Wheat Example):
 - Soil Type: Loamy
 - Seed Rate: 100 kg/ha
 - Irrigation: 3 stages – Crown root initiation, tillering, grain filling
- Fertilizer Schedule (Paddy):
 - Basal Application: 50% Nitrogen + Full Phosphorus and Potassium
 - Top Dressing: Remaining Nitrogen in 2 splits (tillering and panicle stages)

3. Soil Health and Irrigation

- Soil Types and Crop Suitability:
 - Black Soil – Cotton, Soybean

- Alluvial Soil – Rice, Wheat
- Red Soil – Groundnut, Millets
- Soil Testing Parameters (Sample Report):
 - pH: 6.5 | Organic Carbon: 0.75% | Phosphorus: Medium | Recommendation: Apply compost + zinc sulphate
- Micronutrient Management:
 - Boron deficiency in West Bengal causes fruit drop in tomato.
 - Zinc application increases rice yield in Eastern states by 15–20%.
- Efficient Irrigation:
 - Drip irrigation reduces water use by 30–40% in sugarcane.
 - Rainwater harvesting tanks support irrigation during dry spells.

4. Pest and Disease Management

- Common Pests:
 - Brown Plant Hopper (Rice), Fruit Borer (Tomato), Stem Borer (Maize)
- IPM Strategy (Cotton):
 - Cultural: Crop rotation, resistant varieties
 - Mechanical: Yellow sticky traps
 - Biological: Neem extract sprays
 - Chemical: Spot application of pesticide if ETL (Economic Threshold Level) crossed
- Disease Management (Wheat Rust):
 - Use rust-resistant varieties (e.g., HD 2967)
 - Mancozeb spray @2g/litre at initial signs of infection
- Quarantine Advisory:
 - Farmers must report sudden wilting or pest swarms to agriculture officers immediately.
 - Border district quarantine checks help avoid cross-region pest migration.

5. Market Prices and Mandi Information

- Daily/Weekly Mandi Rates (Example, July 2025):
 - Wheat – ₹2,300/ql (Delhi), Tomato – ₹1,500/ql (Bangalore), Onion – ₹2,100/ql (Nashik)
- Minimum Support Price (MSP) 2024–25:
 - Paddy: ₹2,230/ql | Wheat: ₹2,275/ql | Maize: ₹2,090/ql | Cotton: ₹6,620/ql
- Seasonal Trends:
 - Onion prices spike in monsoon due to supply chain disruption.
 - Potato prices rise in April–June before new harvest.
- Grading and Norms:
 - A-grade tomato fetches 20% higher price.
 - Use of electronic weighing and e-NAM trading recommended.

6. Government Schemes & Subsidy Info

- PM-KISAN Scheme:
 - Direct transfer of ₹6,000/year in 3 installments to small/marginal farmers.
- PMFBY – Crop Insurance:
 - Coverage: ₹50,000/ha
 - Premium: ₹300/ha for food crops; up to ₹1,000 for horticulture
- Fertilizer Subsidy:
 - Urea: ₹266/bag (45 kg)
 - DBT implemented via Aadhar authentication at fertilizer outlets.
- Subsidies for Drip Irrigation:
 - Up to 60% subsidy in semi-arid regions under 'Per Drop More Crop' scheme.
- Application Process:
 - Online via state agri portals or CSCs (Common Service Centers)
 - Documents: Land records, Aadhar, Bank account.

7. Success Stories & Case Studies

- Drip Success – Maharashtra:
 - Farmer Rajesh switched to drip irrigation and saved 40% water while doubling grape yield.
- Organic Farming – Tamil Nadu SHG:
 - Women SHG adopted organic turmeric farming and increased profit by ₹20,000/acre.
- Crop Rotation – Punjab:
 - Farmer Manjit Singh adopted wheat-pulse-rice rotation and improved soil health, reducing urea use by 25%.

8. Local Language Content

- IMD and Agri Ministry provide advisories in regional languages:
 - Hindi, Marathi, Tamil, Telugu, Bengali, Kannada
- Sample Hindi Advisory:
 - “पंजाब में भारी बारिश की चेतावनी, धान की रोपाई में देरी करें।”
- Importance:
 - Increases accessibility and comprehension for non-English-speaking farmers.
 - Can be used for local training and radio broadcasts.