FarmHawk

AI-POWERED

Precision Agriculture Intelligence Platform

Report Date: 25-05-2026

REPORT DATE	SATELLITE DATE	CROP	FARM ID
25-05-2026	24-05-2026	Sugarcane	SAMPLE-DEMO-2026-SUGARCANE-ORGANIC

COORDINATES	FARM AREA	DATA SOURCE	FARM LOCATION	DATA FRESHNESS
XX.XXXX ° N, XX.XXXX ° E	6.99 acres	sentinel-2-local	Sample Farm, Andhra Pradesh, India	Yesterday

SATELLITE PASSES
1

🔶 MODERATE VEGETATION HEALTH

🌾 FARM HEALTH OVERVIEW

CROP HEALTH	WATER STATUS	PEST RISK
Moderate	Adequate	Low
NDVI: 0.41	NDMI: 0.09	Forecast: Low

NUTRIENT STATUS	YIELD OUTLOOK	CARBON IMPACT
Moderate	Moderate	Climate Positive
P excess	Monitor	8.1 t CO_2e/ha

📊 FARM HEALTH SCORE

80 out of 100

Vegetation (25%)	60
Moisture (20%)	80
Pest Risk (20%)	90
Nutrients (15%)	90
Env. Stress (10%)	90
Soil pH (5%)	75

📈 INDEX SUMMARY

INDEX	VALUE	STATUS	AREA DISTRIBUTION
Vegetation Health	0.4100	MODERATE 90%	Low 0% Moderate 97% High 3%
Moisture Stress (NDMI)	0.0882	ADEQUATE 90%	Low 71% Moderate 28% High 0%
Chlorophyll Health	0.2700	MODERATE 90%	—
Biotic Stress	—	MODERATE	Low 0% Moderate 97% High 3%
Abiotic Stress	—	MODERATE	Low 71% Moderate 28% High 0%
Micronutrient Stress	—	LOW	—

🎯 TOP PRIORITY ACTIONS

1 🚨 URGENT ACTION REQUIRED

Conduct field inspection of worst-affected zones; apply emergency foliar feed

TIMING: Within 48 hours

2 ⚠️ ACTION RECOMMENDED

Scout for pest and disease progression; apply targeted treatment to affected areas

TIMING: Within 5-7 days

3 🚨 URGENT ACTION REQUIRED

Begin emergency irrigation correction and verify water is reaching the field

TIMING: Within 1-2 days

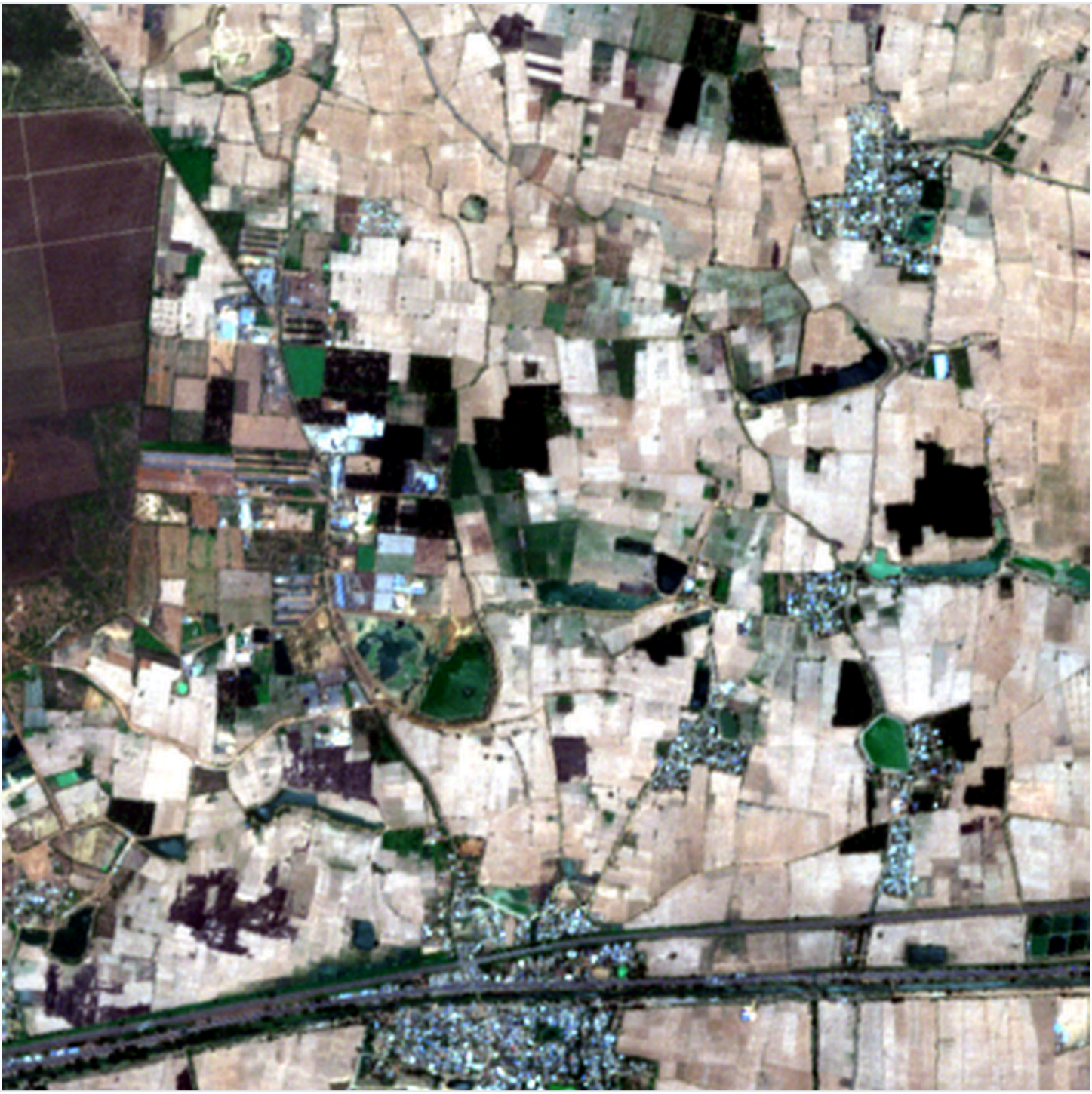
💰 FINANCIAL IMPACT AT A GLANCE

REVENUE AT RISK	RECOVERABLE	ROI

₹6,365/acres	₹4,297/acres	₹1 → ₹2.4

Satellite Overview

Acquisition Date: 2026-05-24T04:57:01.024000Z | Source: sentinel-2-local



True-color composite (B04/B03/B02) from Copernicus Sentinel-2 L2A. Cloud-masked regions appear as semi-transparent gray.

All Primary Indices Information

Satellite-derived measurements and stress analysis for your farm.

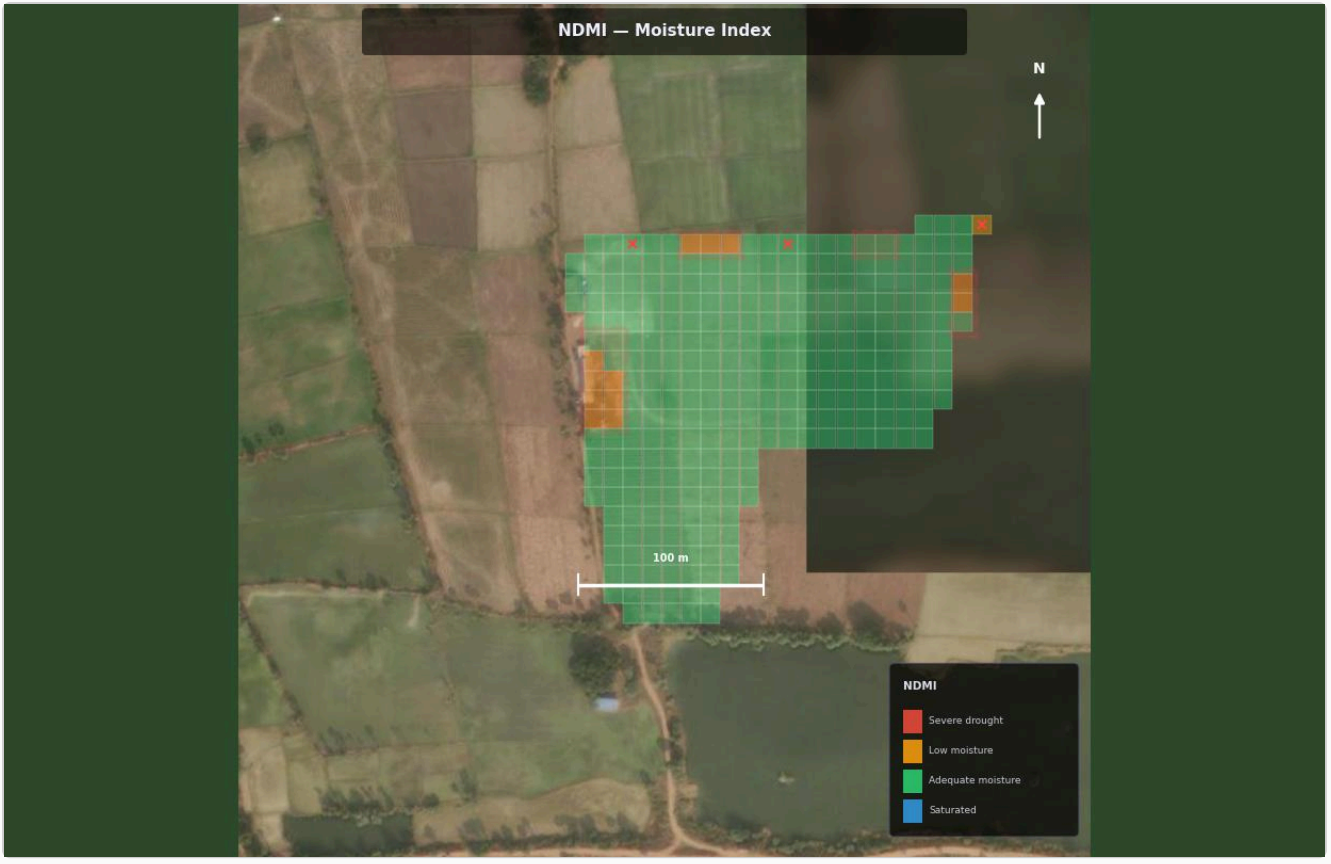
Moisture Stress (NDMI) (NDMI)

VALUE	STATUS	CONF
0.0882	Adequate	90%

💧 SUMMARY

Normalized Difference Moisture Index. Indicates canopy water content. Below 0.1 = drought stress; 0.1–0.3 = moderate; above 0.3 = well-hydrated.

📊 **THRESHOLD LEGEND:** Thresholds: <0.1 Drought Stress | 0.1–0.3 Moderate | >0.3 Optimal



Healthy Moderate Stress

Thresholds: <0.1 Drought Stress | 0.1–0.3 Moderate | >0.3 Optimal

Area Split:: Low 71.2% Moderate 28.4% High 0.4%

⚡ ACTION PLAN LOW

⏱️ WHEN	Start within 24 hours
🔧 WHAT	Emergency deep irrigation; prioritize young productive plants
📏 HOW MUCH	Double irrigation rate for 14 days; target 100%% field capacity at 40cm depth
💰 COST	₹900–1,600/acre
📈 IMPACT	Severe moisture stress causes stomatal closure within 48-72h. With emergency irrigation, partial recovery in 5-7 days; full recovery in 3-4 weeks.
💉 TREATMENT	Apply deep irrigation (40-60mm) within 6-8 hours. Mulch around plants (5-8cm) to reduce evaporation.
⚠️ PRECAUTIONS	Do not apply fertilizers during emergency phase — salt loading worsens osmotic stress.
🔬 SCIENTIFIC BASIS	NDMI 0.0882 is classified as ADEQUATE using Sugarcane Organic-specific thresholds (stress<-0.05, moderate<0.05, optimal>0.20).

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
0.0882	Adequate	90%

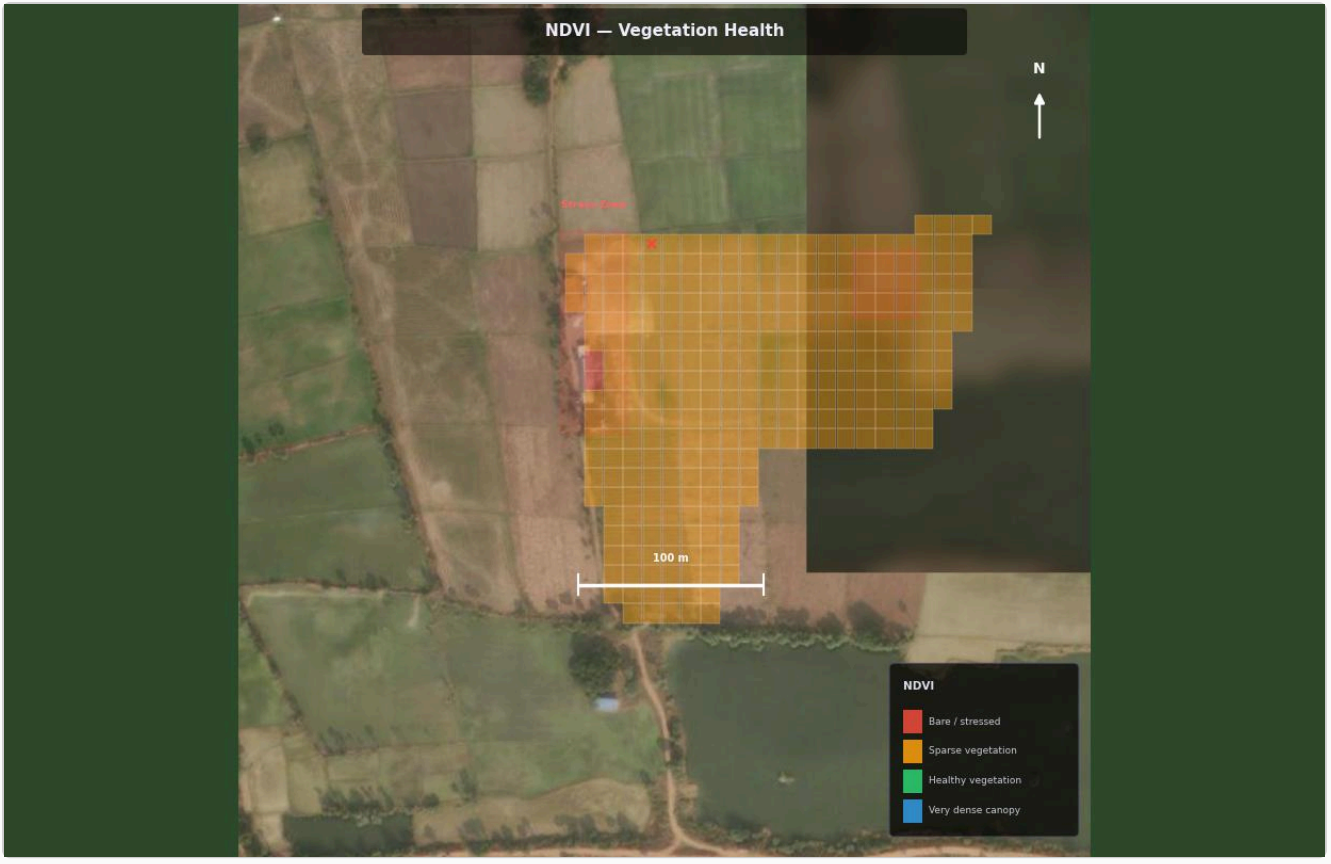
Vegetation Health (NDVI)

VALUE	STATUS	CONF
0.4100	Moderate	90%

SUMMARY

Normalized Difference Vegetation Index. Measures live green vegetation density. Values above 0.6 indicate healthy crops; below 0.3 signals significant stress.

THRESHOLD LEGEND: Thresholds: <0.3 Stress | 0.3–0.6 Moderate | >0.6 Healthy



Healthy Moderate Stress

Thresholds: <0.3 Stress | 0.3–0.6 Moderate | >0.6 Healthy

Area Split:: Low 0.0% Moderate 97.2% High 2.8%

ACTION PLAN MEDIUM

WHEN	Within 7-10 days, prioritizing stressed zones on the satellite map.
WHAT	Apply panchagavya foliar spray (3%) to stressed zones and top-dress with vermicompost (200 kg/acre) to restore soil biological activity and nutrient supply.
HOW MUCH	Panchagavya: 30ml/L at 500L/acre to stressed zones. Vermicompost: 200 kg/acre broadcast around plant base. Supplement with 50 kg neem cake/acre if yellowing visible.
COST	₹500–900/acre
IMPACT	Expected 10-15% improvement in canopy vigor within 2-3 weeks when combined with adequate irrigation and trash mulching.
OBJECTIVE	Restore sugarcane canopy density and leaf area index to optimal range (NDVI > 0.6) through organic nutrition and soil biological enhancement.
TREATMENT	Apply panchagavya foliar spray to stressed zones, followed by vermicompost top-dressing and neem cake incorporation around plant base. If tillering is poor, supplement with fish amino acid foliar spray (2ml/L) for rapid nitrogen boost.
PRECAUTIONS	Avoid foliar application during peak sunlight (10am-3pm). Do not apply if rainfall expected within 4 hours. Ensure adequate soil moisture before applying solid amendments.
SCIENTIFIC BASIS	At NDVI 0.4100, sugarcane canopy reflectance indicates suboptimal chlorophyll concentration and reduced leaf area index. Panchagavya contains plant growth hormones, amino acids, and beneficial microbes that stimulate photosynthesis and canopy recovery.

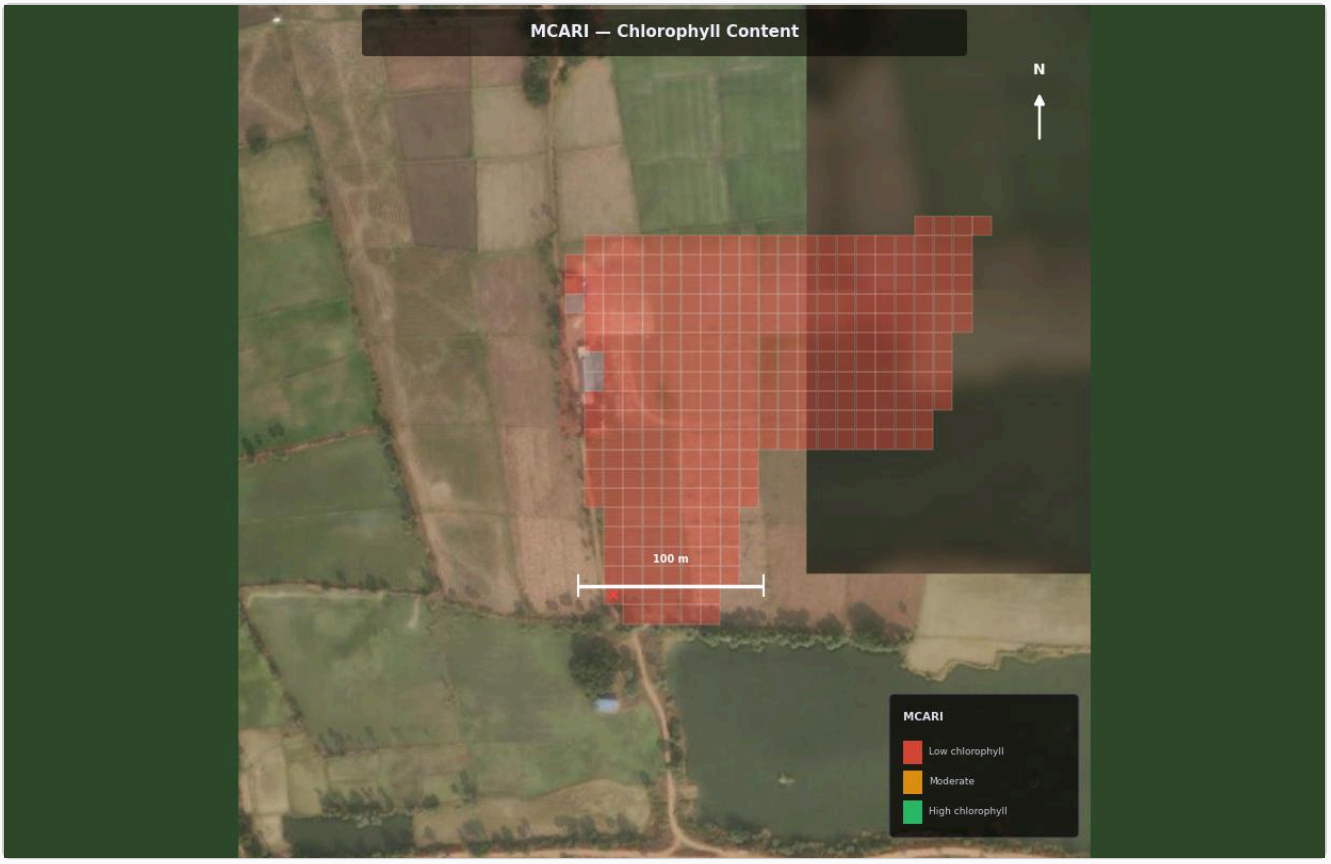
📡 **DATA INSIGHTS**

INDEX VALUE	RISK LEVEL	CONFIDENCE
0.4100	**Moderate**	**90%**

Chlorophyll Health (NDRE)

VALUE	STATUS	CONF
0.2700	Moderate	90%

Chlorophyll-sensitive Red Edge Index. Detects early crop stress before visible symptoms. Values above 0.4 indicate healthy chlorophyll; below 0.2 signals stress.



Healthy Moderate Stress

Thresholds: <0.1 Stress | 0.1–0.3 Moderate | >0.3 Healthy

Area Split:: Low 0.0% Moderate 0.0% High 0.0%

⚡ ACTION PLAN MEDIUM

⏱️ WHEN	Within 3-5 days for moderate; immediate for critical stress.
🔧 WHAT	Apply seaweed extract foliar spray (Ascophyllum nodosum, 2ml/L) combined with organic chelated iron (Fe-EDDHA, 0.5 kg/acre) and manganese sulfate (1 kg/acre — NPOP-approved mineral source). Follow with panchagavya (5%) foliar spray to stimulate chlorophyll regeneration.
📏 HOW MUCH	Seaweed extract: 2ml/L at 500L/acre. Fe-EDDHA: 0.5 kg/acre. Mn sulfate: 1 kg/acre. Panchagavya: 50ml/L at 500L/acre.
💰 COST	₹500–1,100/acre
📈 IMPACT	Chlorophyll recovery expected within 10-14 days with organic micronutrient supplementation.
🎯 OBJECTIVE	Restore chlorophyll-a/b synthesis and photosynthetic capacity using NPOP-approved organic inputs.
💉 TREATMENT	Apply seaweed extract + chelated iron foliar spray. Follow 3 days later with panchagavya (5%) foliar spray. Supplement with jeevamrutha soil drench (200L/acre) to enhance root-zone iron and manganese availability through microbial chelation.
⚠️ PRECAUTIONS	Apply foliar sprays in early morning (6-8am) or late evening to avoid leaf burn. Do not mix seaweed extract with panchagavya in the same tank. Ensure 3-day gap between applications.
🔬 SCIENTIFIC BASIS	At NDRE 0.2700, reduced red-edge reflectance indicates declining chlorophyll-a/b concentrations. Seaweed extract (Ascophyllum nodosum) contains cytokinins and betaines that stimulate chloroplast regeneration. Fe-EDDHA provides plant-available iron that is critical for chlorophyll biosynthesis in alkaline soils.

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
0.2700	**Moderate**	**90%**

💰 COST & ROI

ESTIMATED COST	₹500–1,100/acre
EXPECTED YIELD GAIN	Chlorophyll recovery expected within 10-14 days with organic micronutrient supplementation.

Biotic Stress

RISK STATUS: Moderate
HIGH AREA: 97.2%

Caused by living organisms — pests, pathogens, weeds. This map shows estimated pest and disease stress distribution across the farm.

Healthy Moderate Stress

Green = Low Risk | Yellow = Moderate | Red = High Risk

Area Split:: Low 0.0% Moderate 97.2% High 2.8%

⚡ ACTION PLAN — MEDIUM

⏱️ WHEN	Within the next 3–5 days
🔧 WHAT	Conduct physical field scouting in affected zones. Apply preventive fungicide or insecticide based on identified pest/disease.
📏 HOW MUCH	Targeted spray: cover affected zones plus 10m buffer. Use crop-specific recommended concentrations.
💰 COST	₹700–1,100/acre
📈 IMPACT	Early treatment can contain spread and prevent 15–25% potential yield loss.
🎯 OBJECTIVE	Contain biotic stress to current zones and prevent farm-wide spread.
💉 TREATMENT	Apply registered fungicide (for fungal symptoms) or insecticide (for pest symptoms) per local IPM guidelines. Combine with biological controls where available.
⚠️ PRECAUTIONS	Follow integrated pest management (IPM) protocols. Observe pre-harvest intervals for all chemicals. Use PPE during application.
🔬 SCIENTIFIC BASIS	Satellite spectral analysis detects chlorophyll degradation patterns consistent with biotic stress — irregular, patchy distribution distinct from uniform abiotic stress.

📡 DATA INSIGHTS

RISK LEVEL

Moderate

💰 **COST & ROI**

ESTIMATED COST	₹700–1,100/acre
EXPECTED YIELD GAIN	Early treatment can contain spread and prevent 15–25% potential yield loss.

Micronutrient Stress (Trace Nutrient Deficiency Detection)

INDEX VALUE: —

RISK STATUS: Low

SUMMARY

Deficiencies in Fe, Zn, Mn, B, Cu affect chlorophyll synthesis and enzyme function. This map shows estimated micronutrient stress.

DEFICIENCY LEVELS: Balanced — Adequate nutrients | Moderate — Monitor & apply | High — Immediate correction

MICRONUTRIENT INDICATORS

✓ No significant micronutrient deficiency detected.

Healthy Moderate Stress

Green = Low Risk | Yellow = Moderate | Red = High Risk

Area Split:: Low 100.0% Moderate 0.0% High 0.0%

ACTION PLAN LOW

WHAT

Continue standard fertilization program. Include micronutrient package in next scheduled application.

DATA INSIGHTS

RISK LEVEL

Low

Abiotic Stress (Environmental Stress Detection)

RISK STATUS: Moderate

HIGH AREA: 28.4%

✳ SUMMARY

Caused by non-living factors — heat, drought, waterlogging, salinity. This map shows estimated environmental stress distribution.

📊 **STRESS LEVELS:** Low — Minimal impact | Moderate — Monitor & prepare | High — Immediate action

☁️ DETECTED STRESS INDICATORS

🍗 Reduced canopy moisture

● Healthy ● Moderate ● Stress

Green = Low Risk | Yellow = Moderate | Red = High Risk

Area Split:: Low 71.2% Moderate 28.4% High 0.4%

⚡ **ACTION PLAN** MEDIUM

⏱️ **WHEN**	Within the next 5–7 days
🔧 **WHAT**	Apply mulch to reduce soil temperature. Adjust irrigation timing to cooler hours. Check for waterlogged zones.
📏 **HOW MUCH**	Mulch: 5–8cm layer over root zone. Irrigation shift: move to pre-dawn or evening schedule.
💰 **COST**	₹200–400/acre
📈 **IMPACT**	Stress reduction of 30–50% expected within 1–2 weeks with proper mulching and irrigation adjustment.
🎯 **OBJECTIVE**	Reduce soil surface temperature and evapotranspiration losses. Prevent escalation to high stress.
💉 **TREATMENT**	Apply organic mulch (rice straw, dried leaves, or coconut coir). Adjust irrigation to early morning. Install shade nets for high-value crops if heat stress is dominant.
⚠️ **PRECAUTIONS**	Ensure mulch does not contact plant stems directly — maintain 5cm clearance. Check for fungal issues under mulch in humid conditions.
🔬 **SCIENTIFIC BASIS**	Satellite thermal bands indicate elevated canopy temperature (2–4°C above baseline), correlating with increased vapor pressure deficit (VPD) and reduced stomatal conductance.

📡 **DATA INSIGHTS**

RISK LEVEL

Moderate

Essential Advisory

AI-powered forecasts and management recommendations.

Pest Risk Forecast (AI Pest Intelligence — 7–Day Outlook)

RISK LEVEL	CONFIDENCE	CROP
🟢 Low Risk	55%	Sugarcane

🤖 AI PEST INTELLIGENCE — 7–DAY OUTLOOK

This section predicts potential pest outbreaks based on vegetation trends, moisture stress, and environmental conditions. Early detection helps farmers take preventive action before crop damage occurs.

📊 **Forecast Horizon:** 🟢 Low Risk — 7-Day Outlook 1 satellite pass analyzed

📊 PEST RISK ASSESSMENT

🟢 **Low Risk** Risk Score: **0.03** / 1.00

CONTRIBUTING INDICATORS

- 🦠 Escalating biotic pressure

biotic pressure rising (+0.050/step).

🦠 LIKELY PEST THREATS

✓ *No significant pest threats detected.*

⚡ ACTION PLAN

🔍 SITUATION	No significant deterioration trend detected. Farm health is stable.
✅ RECOMMENDED ACTION	Continue routine weekly scouting. No preventive action needed.

📡 DATA INSIGHTS

FORECAST WINDOW	RISK SCORE	CONFIDENCE
7 days	0.03	55%
SATELLITE PASSES ANALYZED	**CROP**	
1	Sugarcane	

Irrigation Advisory (AI Water Management Recommendation)

SOIL MOISTURE	IRRIGATION NEED	CONFIDENCE
48%	✅ None	92%

💧 AI WATER MANAGEMENT RECOMMENDATION

This section provides irrigation recommendations based on satellite moisture detection, soil properties, and recent weather conditions. Timely irrigation helps prevent crop stress and improves yield outcomes.

📊 **Current Status:** ✅ No Irrigation Required Soil: Loam Crop: Sugarcane

🌍 SOIL MOISTURE STATUS — LOAM SOIL

CURRENT SOIL MOISTURE	48%
FIELD CAPACITY	55%
MOISTURE DEFICIT	7%
REFILL THRESHOLD	37%
WILTING POINT	20%

📊 **Soil Water Availability**

Wilting (20%) **Current: 48%** Field Capacity (55%)

⚡ ACTION PLAN

IRRIGATION NEED	✅ No Irrigation Required
💧 RECOMMENDED DEPTH	21 mm
⏱️ TIMING	Next assessment: 3–5 days
✅ ACTION	No irrigation required.
📋 DETAIL	Soil moisture is at or above the refill threshold. Monitor and reassess in 3–5 days.

🧠 WATER VOLUME ESTIMATE

💧 WATER REQUIRED	21 mm

🌿 EXPECTED CROP RECOVERY

RECOVERY PERIOD	No intervention required.
EXPECTED OUTCOME	Continue monitoring every 5–7 days.

⚠️ IRRIGATION PRECAUTIONS

Avoid unnecessary watering which may cause root diseases. Over-irrigation on saturated soil promotes anaerobic conditions.

📡 DATA INSIGHTS

NDMI / SOIL MOISTURE	DEFICIT SCORE	CONFIDENCE
0.48	0.05	92%

Yield Forecast (AI Crop Production Estimate)

PREDICTED YIELD	YIELD OUTLOOK	CONFIDENCE
📉 18.14 t/ha	Below Average	67%

🌿 AI CROP PRODUCTION ESTIMATE

This forecast estimates expected crop yield based on vegetation health, moisture conditions, environmental stress factors, and historical crop productivity patterns. Early yield predictions help farmers adjust management practices to improve harvest outcomes.

📊 **Benchmark:** Regional average 80.00 t/ha for Sugarcane — 1 satellite pass analyzed

📊 PREDICTED VS BASELINE YIELD

0 t/ha | **18.14 t/ha (23% of baseline)** | Baseline: 80.00 t/ha

🌾 YIELD PREDICTION

🌿 PREDICTED YIELD	18.14 t/ha
📊 REGIONAL AVERAGE	80.00 t/ha
🎯 YIELD DIFFERENCE	**-61.86 t/ha**
🎯 YIELD OUTLOOK	**Significantly Below Average**
📈 YIELD SCORE	23%
🔬 CONFIDENCE	**67%**

🔍 KEY INFLUENCING FACTORS

- 📊 Moderate vegetation health
- ⚠️ Moisture deficit affecting yield potential
- ☀️ Elevated environmental stress detected
- 🦠 Biotic pressure impacting crop condition

📡 INPUT SIGNALS · 1 PASS

🌿 NDVI	0.410
💧 NDMI	0.088
🍃 MCARI	0.074

⚠️ YIELD RISK FACTORS (3 IDENTIFIED)

⚠️ Environmental stress

Abiotic index = 0.91 (above 0.5)

Heat, salinity, or drought stress impairs plant metabolism.

⚠️ Pest/disease pressure

Biotic stress score = 0.51 (above 0.5)

Active pest or disease damage reduces harvestable yield.

⚠️ Low chlorophyll content

MCARI = 0.07 (below 0.3)

Poor chlorophyll limits photosynthesis and dry matter accumulation.

📡 DATA INSIGHTS

PREDICTED YIELD	YIELD OUTLOOK	CONFIDENCE
18.14 t/ha	Below Average	67%
FORECAST WINDOW	**SATELLITE PASSES**	
End of Season Estimate	1	

Action Plan and Financial Forecast

Your weekly action schedule and return on investment analysis.

7-Day Action Plan (Recommended Actions Based on Farm Analysis)

CROP: **Sugarcane** | AREA AFFECTED: **100%**

📅 **WEEKLY FARM ACTION SCHEDULE** **CRITICAL INTERVENTION**

This schedule outlines key farm management activities recommended over the next seven days based on satellite analysis and agronomic intelligence. Tasks are prioritised by severity, affected area, and expected recovery impact.

Timeline	Task	Est. Cost
🔴 **Day 1-2**	Moderate risk affecting 2.8% of farm area detected via satellite. Area affected: 100.0% · Expected recovery: 40–60% · Source: VEGETATION HEALTH	₹500–900/acre
🟡 **Day 3-4**	Scout for Review environmental stress factors and adjust irrigation/shelter as needed. and disease progression; apply targeted treatment to affected zones. Area affected: 100.0% · Expected recovery: 40–60% · Source: BIOTIC STRESS	₹700–1,100/acre
🟢 **Day 5**	Monitor all treated areas and verify soil moisture recovery. Source: VEGETATION HEALTH, BIOTIC STRESS	—
🟢 **Day 6**	Reassess treatment effectiveness and adjust if recovery is below target.	—
✅ **Day 7**	Request satellite rescan to verify recovery signal.	—

⚠️ **IMPORTANT NOTES**

- Adjust timing based on local weather forecast — avoid applying fertilizer before heavy rain.
- Always verify soil moisture before irrigation to prevent waterlogging.
- Re-check satellite imagery 10–14 days after intervention to confirm recovery.
- Consult a qualified agronomist before applying chemicals in large quantities.
- Monitor crop response before additional interventions.
- Re-check satellite imagery 10–14 days after intervention to confirm recovery.

Financial Impact Estimation (Estimated Economic Outcome)

CROP	PROJECTED LOSS	RECOVERABLE
Sugarcane	24.0%	~16.2%

📈 ESTIMATED ECONOMIC OUTCOME

This section estimates potential financial impact based on crop health, yield forecasts, and recommended farm interventions.

Financial outcome estimates based on satellite analysis and regional agronomic benchmarks. Figures are indicative — consult an agronomist for exact pricing.

📉 WITHOUT ACTION

POTENTIAL YIELD LOSS	Estimated yield loss without intervention: Immediate action recommended.
ESTIMATED REVENUE LOSS	₹6,365/acres

Continued moisture, nutrient, and soil pH stress will intensify throughout the growing season, reducing photosynthetic efficiency and limiting grain fill.

📈 WITH INTERVENTION

EXPECTED YIELD RECOVERY	~16.2%
ESTIMATED REVENUE RECOVERY	₹4,297/acres

Without Action	Estimated Loss 24.0%
With Intervention	Estimated yield recovery of 16.2% with irrigation correction.
ROI Analysis	For every $1 invested in corrective measures, an estimated $3–5 in crop value is expected to be recovered.
Confidence Note	*Yield projections are derived from validated satellite index readings and area distributions only. Actual monetary outcomes depend on local crop price, farm size, soil type, and management response speed. These are evidence-based estimates, not financial guarantees.*

💸 INTERVENTION COSTS

▸ PEST / DISEASE MONITORING	—
TOTAL ESTIMATED COST	₹1,760/acres

📊 COST-BENEFIT SUMMARY (PER ACRES)

REVENUE AT RISK	REVENUE SAVED	COST:BENEFIT
₹6,365/acres	₹4,297/acres	1:2.4

📈 ROI ANALYSIS

INVESTMENT	₹1,760/acres
POTENTIAL RECOVERY	₹4,297/acres
ESTIMATED RETURN	2.4× investment

0× — 2.4× return — 5×

📊 PRICE INTELLIGENCE — 20-YEAR HISTORICAL ANALYSIS

20-year inflation-adjusted median • 20 data points • CPI ref 2024

CROP PRICE (20-YR MEDIAN)	₹3.61/kg	RECOVERY POTENTIAL (PER ACRES)	₹10,617
REVENUE PER ACRES	₹65,538	RECOVERY POTENTIAL (FARM TOTAL)	₹30,046
FARM REVENUE ESTIMATE	₹185,473	REVENUE AT RISK (PER ACRES)	₹6,365

🌏 FARM-LEVEL FINANCIAL ESTIMATE

FARM AREA	6.99 acres
TOTAL POTENTIAL LOSS	₹44,491
TOTAL RECOVERY POTENTIAL	₹30,036

⚠️ DISCLAIMER

All monetary figures are estimates based on satellite-derived stress metrics and regional benchmark data. Actual costs and yield outcomes may vary based on local market prices, soil variation, weather conditions, and farm management practices. FarmHawk AI is not responsible for decisions made solely based on this report.

Non-Essential Advisory

Supplementary analysis for agronomists and extension workers.

Carbon Impact (Climate Intelligence Estimate)

CARBON SEQUESTRATION	ENVIRONMENTAL IMPACT	CONFIDENCE
16.93 t CO_2e/ha	🌿 Strongly Positive	50%

🌿 CLIMATE INTELLIGENCE ESTIMATE

Growing crops absorb carbon dioxide from the atmosphere and store it in plant biomass and soil organic matter. Healthy vegetation and sustainable farming practices increase carbon sequestration and contribute to climate mitigation.

📊 **Methodology:** IPCC Tier 1 biomass-carbon conversion — carbon fraction 0.45 · CO_2e multiplier 3.67 · 1 satellite pass analyzed

📊 CO_2E SEQUESTRATION INTENSITY

0 t CO_2e/ha — **16.93 t CO_2e/ha** — 20 t CO_2e/ha

🌏 CARBON SEQUESTRATION METRICS

🌿 ESTIMATED CARBON SEQUESTRATION	16.93 t CO₂e / ha
🌿 ABOVE-GROUND BIOMASS	10.25 t/ha
🔬 CARBON STORED	4.61 t C/ha
☀️ ENVIRONMENTAL IMPACT	🌿 **Strongly Positive**
🔬 CONFIDENCE	50%
📉 EQUIVALENT CAR OFFSET	≈ 3.7 cars/year (per ha)

🌿 ENVIRONMENTAL IMPACT: STRONGLY POSITIVE

Exceptional vegetation density indicates highly effective carbon capture across this farm.

➡️ CARBON TREND ANALYSIS

🌿 VEGETATION TREND	Stable
📈 NDVI CHANGE/PASS	↑ **+0.0000/step**
🛰️ PASSES ANALYZED	1

📡 SATELLITE SIGNALS & MODEL PARAMETERS

NDVI	0.410
NDMI	0.088
MCARI	0.074
BIOMASS COEFFICIENT	25.0
CARBON FRACTION	0.45 (IPCC Tier 1)
CO_2E MULTIPLIER	3.67 (44/12)

🏦 ESG & CARBON CREDIT POTENTIAL

This farm sequesters approximately **16.93 t CO_2e/ha** (strongly positive climate impact). Sequestration data supports ESG reporting, Verra VCS / Gold Standard carbon credit programmes, and sustainability certification. Contact a carbon credit aggregator to monetise these credits.

📡 DATA INSIGHTS

CARBON SEQUESTRATION	ENVIRONMENTAL IMPACT	CONFIDENCE
16.93 t CO_2e / ha	**Strongly Positive**	**50%**

SATELLITE PASSES

1

Nutrient Status Matrix (Farm Nutrient Balance Overview)

⚖️ **NUTRIENT BALANCE OVERVIEW**

This table summarizes the nutrient balance across the farm based on satellite analysis. Status and priority levels are derived from index values and spatial distribution of nutrient zones.

📊 **Status Key:** Balanced / Optimal — Green | Moderate — Orange | Severe — Red

⚖️ Nutrient Matrix — All Nutrients

Nutrient	Index Value	Status	High Area	Priority
Nitrogen (N)	50.77	**Optimal**	0%	**Maintain / Monitor**
Phosphorus (P)	89.38	**Severe Excess**	100%	**Reduce / Correct**
Potassium (K)	65.80	**Optimal**	36%	**Maintain / Monitor**
Soil pH	6.49	**Optimal**	0%	**Maintain / Monitor**

📋 **NUTRIENT MANAGEMENT SUMMARY**

Nutrient balance across the farm is generally stable. Localized high Phosphorus Analysis zones were detected and fertilizer application should be adjusted accordingly.

Nitrogen Analysis (N)

INDEX VALUE	RISK STATUS	CONF
50.7670	Optimal	90%

🌿 SUMMARY

Nitrogen is a critical macronutrient for plant growth, affecting chlorophyll production and overall biomass.

📊 **STATUS ZONES:** Low — Deficient | Balanced — Optimal | High — Excess

⚠️ IMPORTANT NUTRIENT MAP NOTE

Red zones on nutrient maps represent high nutrient concentration, not crop stress. This indicates areas where fertilizer application should be reduced to prevent nutrient toxicity and maintain balanced soil fertility.

● Low ● Moderate ● High Map: Green = Low | Yellow = Moderate | Red = High/Excess. Note: Red = high nutrient concentration, not stress. *(Red = high nutrient concentration, not stress)*

Area Split:: Low 61.1% Moderate 38.9% High 0.0%

⚡ ACTION PLAN LOW

🔧 **WHAT**

Nitrogen levels are currently optimal. No corrective Nitrogen application needed; maintain standard monitoring.

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
50.7670	Optimal	90%

Phosphorus Analysis (P)

INDEX VALUE	RISK STATUS	CONF
89.3836	Severe Excess	90%

🌿 SUMMARY

Phosphorus drives root development, flowering, and fruiting. Deficiency leads to stunted growth and reduced yields.

📊 **STATUS ZONES:** Low — Deficient | Balanced — Optimal | High — Excess

⚠️ IMPORTANT NUTRIENT MAP NOTE

Red zones on nutrient maps represent high nutrient concentration, not crop stress. This indicates areas where fertilizer application should be reduced to prevent nutrient toxicity and maintain balanced soil fertility.

Low Moderate High

Map: Green = Low | Yellow = Moderate | Red = High/Excess. Note: Red = high nutrient concentration, not stress. *(Red = high nutrient concentration, not stress)*

Area Split:: Low 0.0% Moderate 0.0% High 100.0%

⚡ ACTION PLAN

⏱️ WHEN	Cease Phosphorus applications immediately
🔧 WHAT	Stop all Phosphorus-containing fertilizers for the next 4–6 weeks.
📏 HOW MUCH	Zero application. Target reduction: Phosphorus index should drop below 80.
💰 COST	$0 (Cost savings from suspended application)
📈 IMPACT	Excessive Phosphorus can lead to surface water contamination and aquatic toxicity.
🎯 OBJECTIVE	High Phosphorus levels are triggering nutrient lockout for Excess Phosphorus locks out Zinc (Zn), Iron (Fe), and Manganese (Mn), causing micronutrient deficiency..
💉 TREATMENT	Increase irrigation to leech excess Phosphorus salts if drainage is adequate. Apply organic matter to buffer soil and reduce Phosphorus concentration.
⚠️ PRECAUTIONS	Monitor secondary nutrient deficiency symptoms which may be induced by Phosphorus excess.
🔬 SCIENTIFIC BASIS	At Phosphorus index 89.38, the concentration is toxic to soil microbes and interferes with the uptake of antagonistic ions.

💰 COST & ROI

ESTIMATED COST	$0 (Cost savings from suspended application)
EXPECTED YIELD GAIN	Excessive Phosphorus can lead to surface water contamination and aquatic toxicity.

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
89.3836	**Severe Excess**	**90%**

Potassium Analysis (K)

INDEX VALUE	RISK STATUS	CONF
65.7960	Optimal	90%

🌿 SUMMARY

Potassium regulates water uptake, enzyme activation, and stress tolerance. Low levels reduce drought resistance.

📊 **STATUS ZONES:** Low — Deficient | Balanced — Optimal | High — Excess

⚠️ IMPORTANT NUTRIENT MAP NOTE

Red zones on nutrient maps represent high nutrient concentration, not crop stress. This indicates areas where fertilizer application should be reduced to prevent nutrient toxicity and maintain balanced soil fertility.

Low Moderate High

Map: Green = Low | Yellow = Moderate | Red = High/Excess. Note: Red = high nutrient concentration, not stress. *(Red = high nutrient concentration, not stress)*

Area Split:: Low 63.2% Moderate 1.1% High 35.8%

⚡ ACTION PLAN LOW

🔧 **WHAT**

Potassium levels are currently optimal. No corrective Potassium application needed; maintain standard monitoring.

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
65.7960	Optimal	90%

Soil pH (pH)

INDEX VALUE	RISK STATUS	CONF
6.4886	Optimal	90%

🌿 SUMMARY

Soil pH controls nutrient availability and microbial activity. Optimal range: 6.0–7.5. Values outside this lock out key nutrients.

📊 **STATUS ZONES:** Low — Deficient | Balanced — Optimal | High — Excess

⚠️ IMPORTANT NUTRIENT MAP NOTE

Red zones on nutrient maps represent high nutrient concentration, not crop stress. This indicates areas where fertilizer application should be reduced to prevent nutrient toxicity and maintain balanced soil fertility.

● Low ● Moderate ● High Map: Green = Low | Yellow = Moderate | Red = High/Excess. Note: Red = high nutrient concentration, not stress. *(Red = high nutrient concentration, not stress)*

Area Split:: Low 100.0% Moderate 0.0% High 0.0%

⚡ ACTION PLAN LOW

🔧 **WHAT**

Soil pH is within the optimal window for maximum nutrient bioavailability. No corrective action required.

📡 DATA INSIGHTS

INDEX VALUE	RISK LEVEL	CONFIDENCE
6.4886	Optimal	90%