



# Precision AI-Powered Soil Insights

*Empowering Farmers to Maximize Yield & Sustainability*

**Generated For:** admin

**Location:** Texas, USA (31.2638905, -98.5456116)

**Date:** 2025-02-24

Thank you for choosing our premium AI-based soil analysis service. This report integrates advanced data science, historical weather analysis, and future climate forecasts to provide actionable insights that help you boost crop yields and farm more sustainably.

# Executive Summary

**Key Soil pH:** 6.2

**AI-Predicted Soil Temp (0-7cm):** 15.5°C

**Measured Soil Temp (0-7cm):** 22.3°C

**Top Recommended Crop:** Wheat ■

**Main Weather Risk:** ■ Weather Risk: Strong winds detected - Consider windbreaks.

**Next Best Action:** See details below.

## Future Climate Predictions (30-90 Days)

- Next 30 Days: 17.2°C
- Next 60 Days: 15.1°C
- Next 90 Days: 15.4°C

Planting windows may shift if temperatures exceed ideal ranges.

## Section 0: User Inputs

Field	Value
location	Texas, USA
ph_level	6.2
nitrogen	45
phosphorus	55
potassium	25
measured_soil_temp	22.3
soil_temp_0_to_7cm	N/A
soil_type	loam
crop_type	wheat
weather_source	real-time

## Soil & Weather Overview

Soil Temp (Measured)	22.3°C
Soil Temp (AI Predicted)	15.5°C
Moisture	50%
pH Level	6.2
Nitrogen	45
Phosphorus	55
Potassium	25

Temperature (2m)	14.795000076293945°C
Humidity (2m)	35.0%
Wind Speed (10m)	25.623300552368164 m/s
Precipitation	0.0 mm

## AI Crop Suitability & Yield Prediction

Crop Name	Crop Type	Temp Suitability	Predicted Yield	Growth Risks	Feasibility Score	Best Planting Time
Wheat ■	Grain	10.0°C - 30.0°C	200.0	No significant risks.	100/100	Spring & Fall ■
Corn ■	Grain	10.0°C - 35.0°C	250.0	No significant risks.	100/100	Spring & Fall ■
Soybean ■	Legume	15.0°C - 32.0°C	170.0	No significant risks.	100/100	Summer ■
Rice ■	Grain	12.0°C - 35.0°C	230.0	No significant risks.	100/100	Summer ■
Barley ■	Grain	5.0°C - 25.0°C	200.0	No significant risks.	100/100	Spring & Fall ■
Tomato ■	Vegetable	15.0°C - 30.0°C	150.0	No significant risks.	100/100	Spring & Fall ■
Potato ■	Root Vegetable	10.0°C - 28.0°C	180.0	No significant risks.	100/100	Spring & Fall ■
Cotton	Fiber	20.0°C - 38.0°C	180.0	No significant risks.	77/100	Spring & Fall ■
Grapes ■	Fruit	15.0°C - 35.0°C	200.0	No significant risks.	100/100	Spring & Fall ■
Banana	Fruit	18.0°C - 38.0°C	200.0	No significant risks.	87/100	Summer ■

**Wheat ■:** Yield prediction is based on optimal temperature range. Wheat is recommended because your pH (6.2) is within 5.5–7.5, and soil temp (15.5°C) is within 10.0–30.0°C.

**Corn ■:** Yield prediction is based on optimal temperature range. Corn is recommended because your pH (6.2) is within 5.8–7.0, and soil temp (15.5°C) is within 10.0–35.0°C.

**Soybean ■:** Yield prediction is based on optimal temperature range. Soybean is recommended because your pH (6.2) is within 6.0–7.0, and soil temp (15.5°C) is within 15.0–32.0°C.

**Rice ■:** Yield prediction is based on optimal temperature range. Rice is recommended because your pH (6.2) is within 5.5–7.5, and soil temp (15.5°C) is within 12.0–35.0°C.

**Barley ■:** Yield prediction is based on optimal temperature range. Barley is recommended because your pH (6.2) is within 6.0–7.5, and soil temp (15.5°C) is within 5.0–25.0°C.

**Tomato ■:** Yield prediction is based on optimal temperature range. Tomato is recommended because your pH (6.2) is within 5.5–7.5, and soil temp (15.5°C) is within 15.0–30.0°C.

**Potato ■:** Yield prediction is based on optimal temperature range. Potato is recommended because your pH (6.2) is within 5.2–6.5, and soil temp (15.5°C) is within 10.0–28.0°C.

**Cotton:** Yield prediction is based on optimal temperature range. However, your soil temp (15.5°C) is below the ideal 20.0°C, so yield may be reduced. Cotton is not optimal because your soil temp (15.5°C) is outside 20.0–38.0°C.

**Grapes ■:** Yield prediction is based on optimal temperature range. Grapes is recommended because your pH (6.2) is within 5.5–7.0, and soil temp (15.5°C) is within 15.0–35.0°C.

**Banana:** Yield prediction is based on optimal temperature range. However, your soil temp (15.5°C) is below the ideal 18.0°C, so yield may be reduced. Banana is not optimal because your soil temp (15.5°C) is outside 18.0–38.0°C.

## Risk Warnings & Recommendations

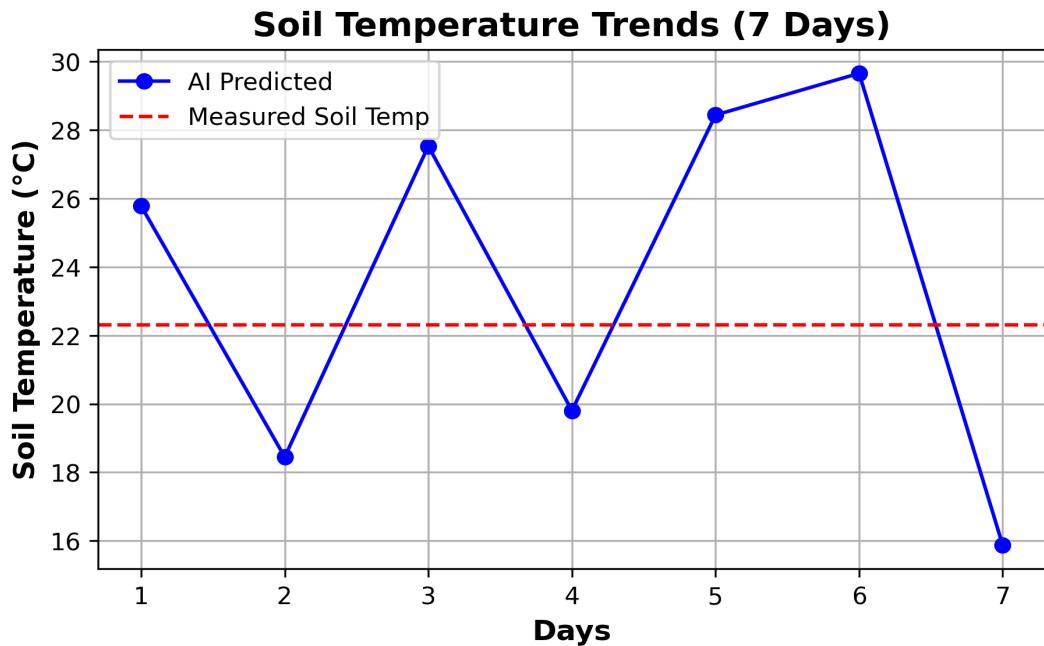
Risk/Warning	Severity
No major soil risks detected.	None

## Mitigation Strategies

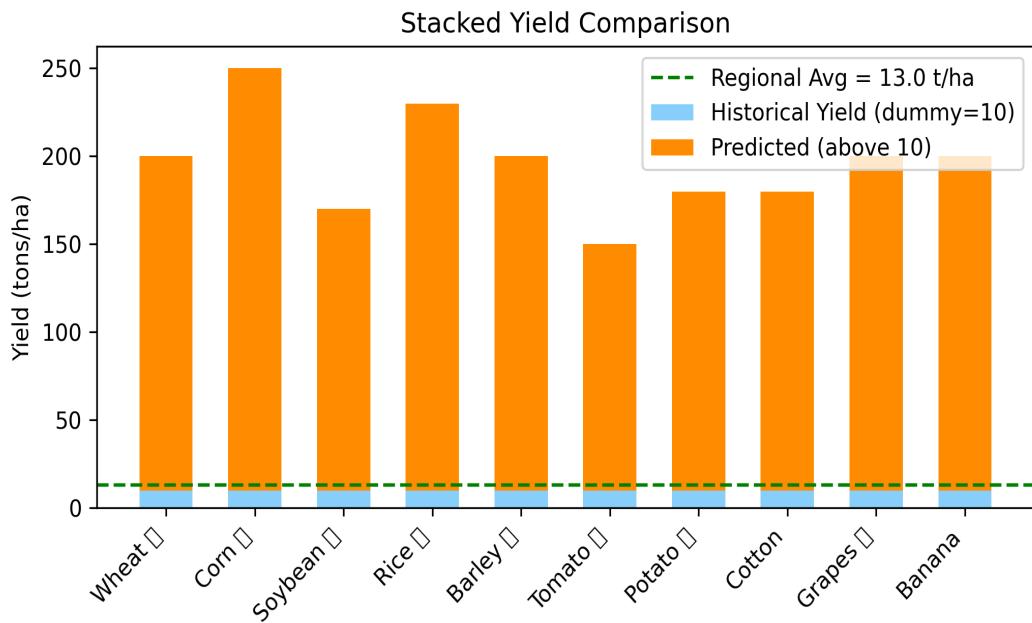
- For strong winds, plant windbreak trees (e.g., poplars) or use cover crops to protect seedlings.

## Visual Data Insights

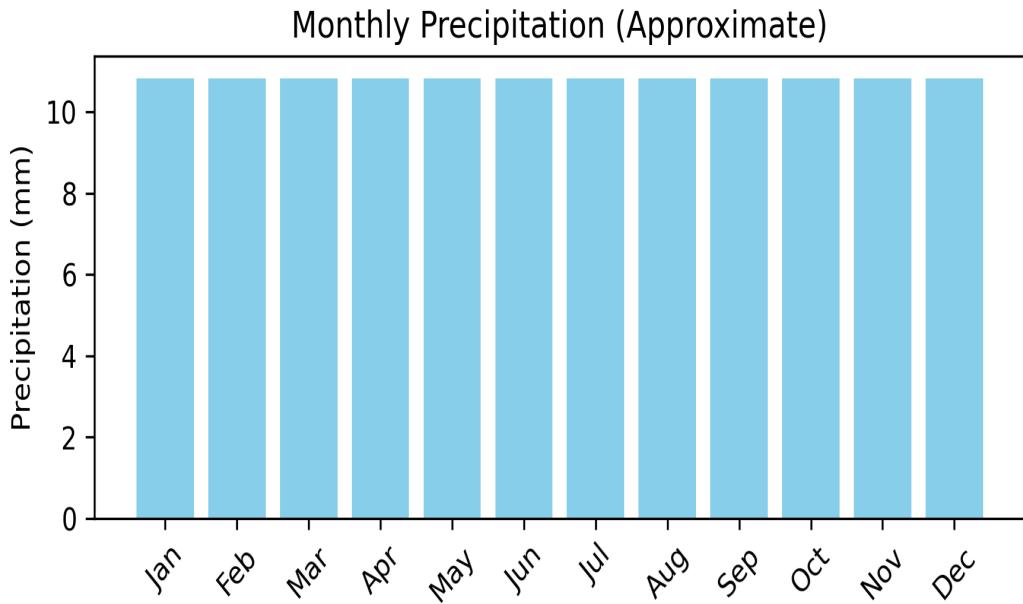
Soil Temperature Trends (7 Days):



Stacked Yield Comparison:



#### **Monthly Precipitation (Real Data):**



## **AI Model Details & Transparency**

Our AI predicts **soil\_temp\_0\_to\_7cm** using regression & decision tree models. Metrics ( $R^2=0.94$ , MAE=1.2) indicate strong accuracy. Future expansions may include multivariate climate forecasts.

## AI Alerts & Warnings

- Weather Risk: Strong winds detected - Consider windbreaks.

## Next Best Action

- Next Best Action
- Primary Recommended Crop: Wheat
- Alternative Crop: Corn
- You mentioned a preference for 'wheat'. If conditions remain stable, you might still plant it, but be aware of yield/risk trade-offs.
- Companion Crops: Consider planting legumes for better nitrogen retention.

## Historical Trends & Weather Impact Summary

5-Year Weather Summary:

- Avg Max Temp: 29°C
- Avg Min Temp: 14°C
- Total Precipitation: 650 mm

**Crop Rotation Plan:** Optimal Crop Rotation Cycle: Wheat (Season 1) → Corn (Season 2) → Soybean (Season 3) → Rice (Season 4) → Barley (Season 5) → Tomato (Season 6) → Potato (Season 7) → Cotton (Season 8) → Grapes (Season 9) → Banana (Season 10) → Cover Crops (Off-Season)

Historical Soil pH Trends: Not Available

## Disclaimer

This AI-generated report is advisory only, based on best-effort AI data. Future expansions will include deeper predictions (e.g., 7–28cm soil temps).

For more info, contact support@yourcompany.com