



# Precision AI-Powered Soil Insights

*Empowering Farmers to Maximize Yield & Sustainability*

**Generated For:** test2

**Location:** California (36.7014631, -118.755997)

**Date:** 2025-03-05

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

**AI-Predicted Soil Temp (0-7cm):** -0.57°C

**Measured Soil Temp (0-7cm):** 1.3°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: 1.4°C
- Next 60 Days: -2.4°C
- Next 90 Days: 2.7°C

Planting windows may shift if temperatures exceed ideal ranges.

## Section 0: User Inputs

Field	Value
location	California
ph_level	6
nitrogen	76
phosphorus	0
potassium	0
measured_soil_temp	1.3
soil_temp_0_to_7cm	N/A
soil_type	loam
crop_type	Cotton
weather_source	historical trends

## Soil & Weather Overview

Soil Temp (Measured)	1.3°C
Soil Temp (AI Predicted)	-0.57°C
Moisture	43%
pH Level	6
Nitrogen	76
Phosphorus	0
Potassium	0

Temperature (2m)	-3.2°C
Humidity (2m)	91%
Wind Speed (10m)	12.3 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.	47/100	Spring & Fall ■■
Corn	Grain	10.0°C - 35.0°C	250.0	No significant risks.	47/100	Spring & Fall ■■
Soybean	Legume	15.0°C - 32.0°C	170.0	No significant risks.	22/100	Summer ■■
Rice	Grain	12.0°C - 35.0°C	230.0	No significant risks.	37/100	Summer ■■
Barley	Grain	5.0°C - 25.0°C	200.0	No significant risks.	72/100	Spring & Fall ■■
Tomato	Vegetable	15.0°C - 30.0°C	150.0	No significant risks.	22/100	Spring & Fall ■■
Potato	Root Vegetable	10.0°C - 28.0°C	180.0	No significant risks.	47/100	Spring & Fall ■■
Cotton	Fiber	20.0°C - 38.0°C	180.0	No significant risks.	0/100	Spring & Fall ■■
Grapes	Fruit	15.0°C - 35.0°C	200.0	No significant risks.	22/100	Spring & Fall ■■
Banana	Fruit	18.0°C - 38.0°C	200.0	No significant risks.	7/100	Summer ■■

**Wheat:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 10.0°C, so yield may be reduced. Wheat is not optimal because your soil temp (-0.57°C) is outside 10.0–30.0°C.

**Corn:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 10.0°C, so yield may be reduced. Corn is not optimal because your soil temp (-0.57°C) is outside 10.0–35.0°C.

**Soybean:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 15.0°C, so yield may be reduced. Soybean is not optimal because your soil temp (-0.57°C) is outside 15.0–32.0°C.

**Rice:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 12.0°C, so yield may be reduced. Rice is not optimal because your soil temp (-0.57°C) is outside 12.0–35.0°C.

**Barley:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 5.0°C, so yield may be reduced. Barley is not optimal because your soil temp (-0.57°C) is outside 5.0–25.0°C.

**Tomato:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 15.0°C, so yield may be reduced. Tomato is not optimal because your soil temp (-0.57°C) is outside 15.0–30.0°C.

**Potato:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 10.0°C, so yield may be reduced. Potato is not optimal because your soil temp (-0.57°C) is outside 10.0–28.0°C.

**Cotton:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 20.0°C, so yield may be reduced. Cotton is not optimal because your soil temp (-0.57°C) is outside 20.0–38.0°C.

**Grapes:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 15.0°C, so yield may be reduced. Grapes is not optimal because your soil temp (-0.57°C) is outside 15.0–35.0°C.

**Banana:** Yield prediction is based on optimal temperature range. However, your soil temp (-0.57°C) is below the ideal 18.0°C, so yield may be reduced. Banana is not optimal because your soil temp (-0.57°C) is outside 18.0–38.0°C.

## Risk Warnings & Recommendations

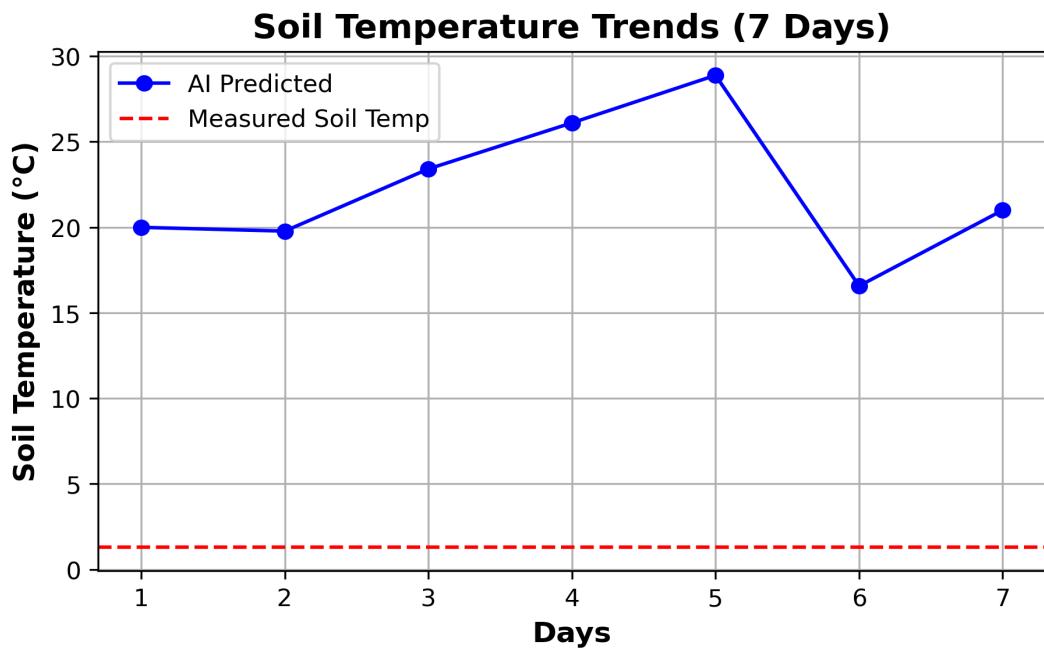
Risk/Warning	Severity
No major soil risks detected.	None

## Mitigation Strategies

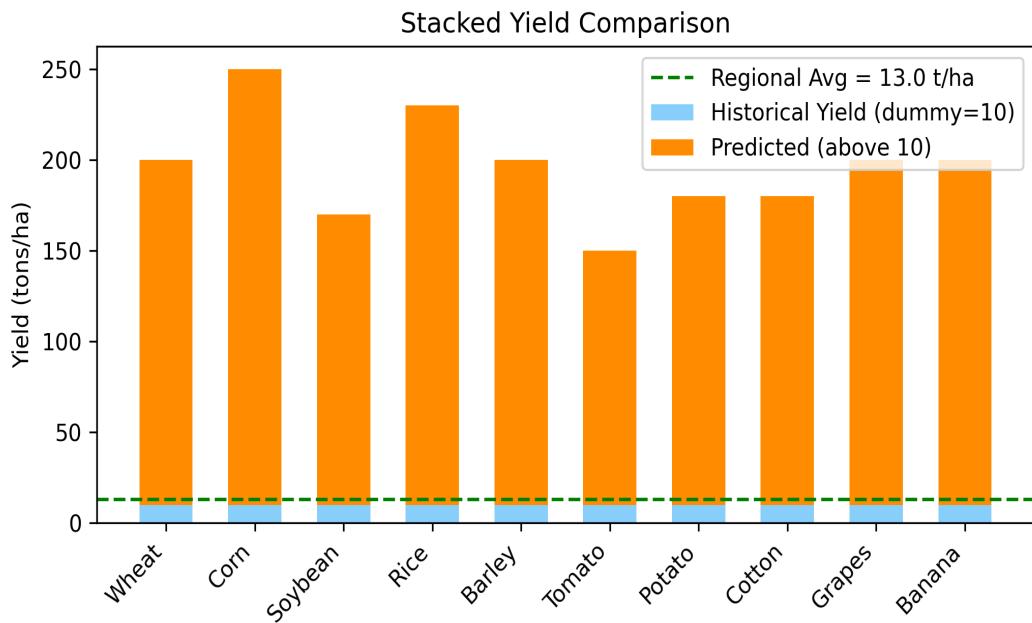
- For strong winds, plant windbreak trees (e.g., poplars) or use cover crops to protect seedlings.

## Visual Data Insights

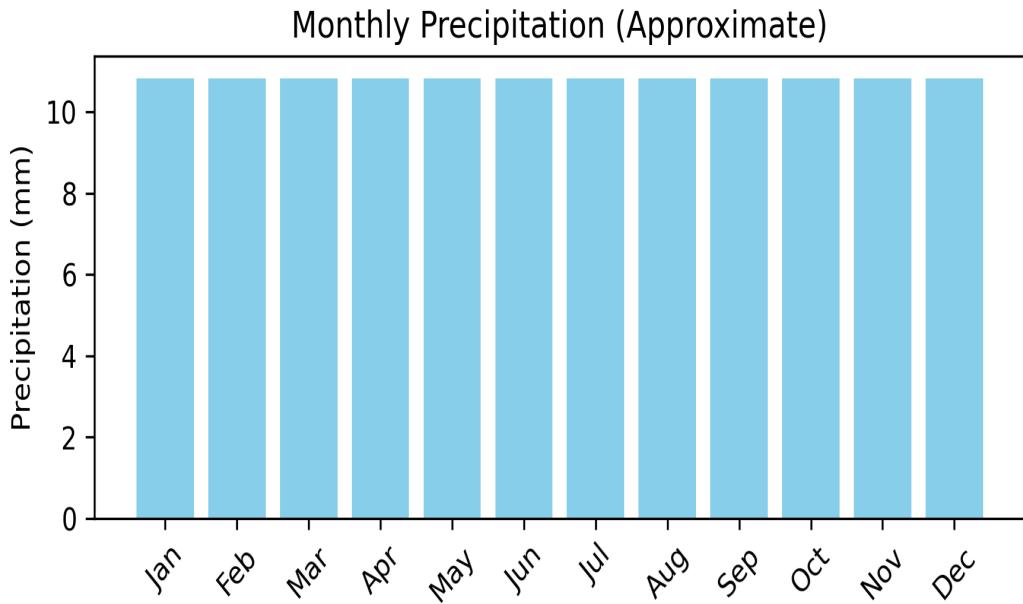
Soil Temperature Trends (7 Days):



Stacked Yield Comparison:



#### **Monthly Precipitation:**



## **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.
- Weather Risk: Temperature fluctuation risk - Adjust irrigation.

## Next Best Action

### ■ Next Best Action

All recommended crops require some soil adjustments (pH or temperature) to be fully optimal. Consider pH correction or other mitigation.

■ You mentioned a preference for 'Cotton'. 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