



# Precision AI-Powered Soil Insights

*Empowering Farmers to Maximize Yield & Sustainability*

**Generated For:** test

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

**Date:** 2025-03-02

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):** 5.02°C

**Measured Soil Temp (0-7cm):** 9.9°C

**Top Recommended Crop:** Barley ■

**Main Weather Risk:** ■ Weather Risk: Temperature fluctuation risk - Adjust irrigation.

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

## Future Climate Predictions (30-90 Days)

- Next 30 Days: 7.0°C
- Next 60 Days: 7.7°C
- Next 90 Days: 7.5°C

Planting windows may shift if temperatures exceed ideal ranges.

## Section 0: User Inputs

Field	Value
location	California
ph_level	6
nitrogen	4
phosphorus	0
potassium	0
measured_soil_temp	9.9
soil_temp_0_to_7cm	N/A
soil_type	chalk
crop_type	Barley
weather_source	historical trends

## Soil & Weather Overview

Soil Temp (Measured)	9.9°C
Soil Temp (AI Predicted)	5.02°C
Moisture	50%
pH Level	6
Nitrogen	4
Phosphorus	0
Potassium	0

Temperature (2m)	2.4°C
Humidity (2m)	88%
Wind Speed (10m)	1.3 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
Barley	Grain	5.0°C - 25.0°C	200.0	No significant risks.	100/100	Spring & Fall
Grapes	Fruit	15.0°C - 35.0°C	200.0	No significant risks.	50/100	Spring & Fall

**Barley**: Yield prediction is based on optimal temperature range. Barley is recommended because your pH (6) is within 6.0–7.5, and soil temp (5.02°C) is within 5.0–25.0°C.

**Grapes**: Yield prediction is based on optimal temperature range. However, your soil temp (5.02°C) is below the ideal 15.0°C, so yield may be reduced. Grapes is not optimal because your soil temp (5.02°C) is outside 15.0–35.0°C.

## Risk Warnings & Recommendations

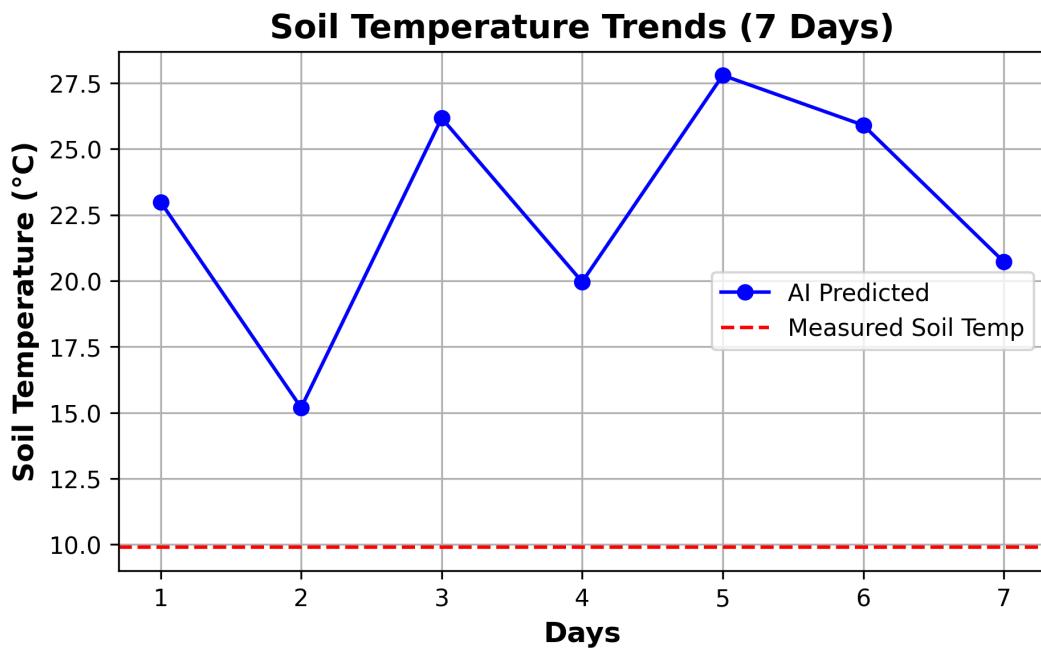
Risk/Warning	Severity
Low nitrogen – Apply nitrogen-rich fertilizer.	High

## Mitigation Strategies

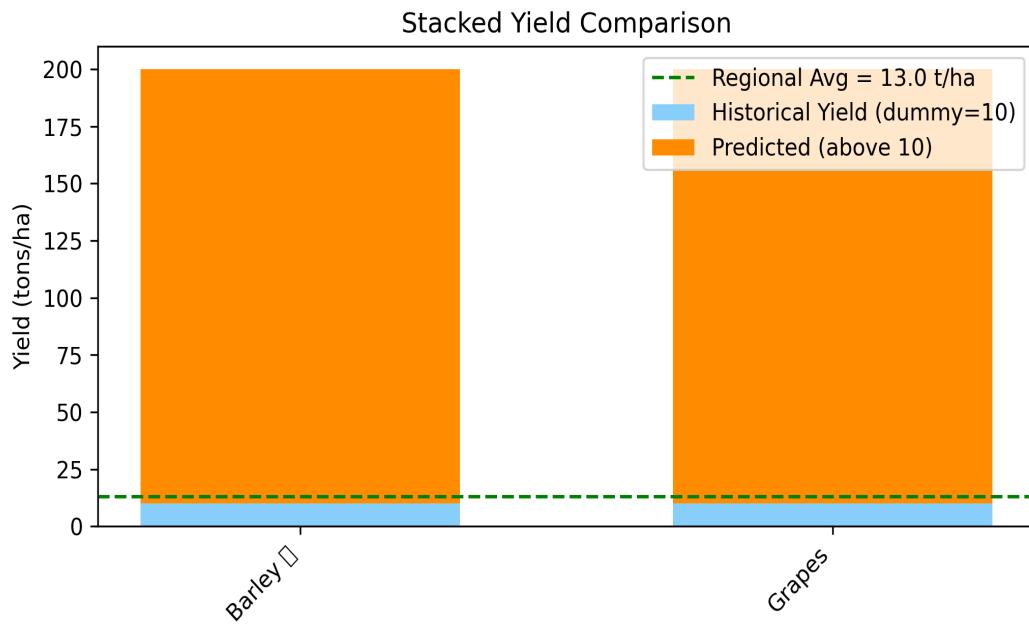
- Soil nitrogen is low. Apply ~40 kg/ha of Urea or Ammonium Sulfate. Consider intercropping with legumes.
- For strong winds, plant windbreak trees (e.g., poplars) or use cover crops to protect seedlings.

## Visual Data Insights

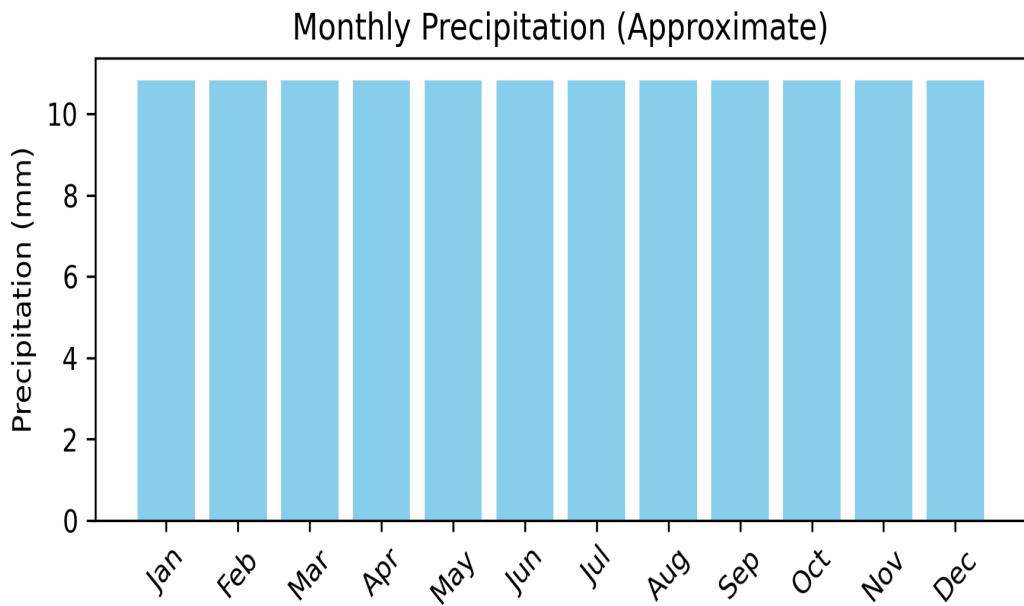
### Soil Temperature Trends (7 Days):



#### 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: Temperature fluctuation risk - Adjust irrigation.
- Soil Issue: Your soil nitrogen (4 mg/kg) is below the optimal 20 mg/kg. Apply 40 kg/ha of Urea.

## Next Best Action

- Next Best Action
- Primary Recommended Crop: Barley
- You mentioned a preference for 'Barley'. 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: Barley (Season 1) → Grapes (Season 2) → 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