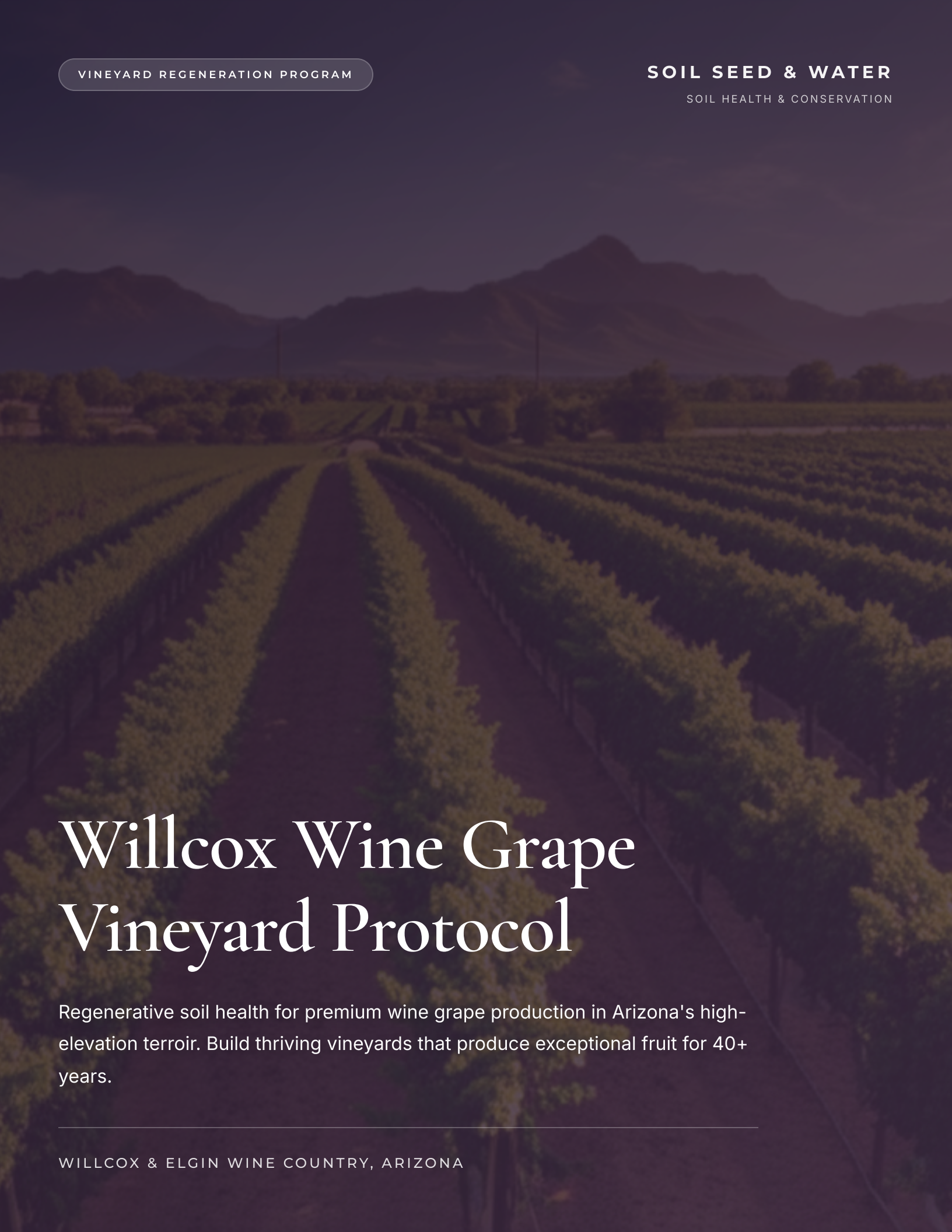
VINEYARD REGENERATION PROGRAM

SOIL SEED & WATER

SOIL HEALTH & CONSERVATION



Willcox Wine Grape Vineyard Protocol

Regenerative soil health for premium wine grape production in Arizona's high-elevation terroir. Build thriving vineyards that produce exceptional fruit for 40+ years.

WILLCOX & ELGIN WINE COUNTRY, ARIZONA

REGIONAL ANALYSIS

The Willcox Advantage

High-elevation terroir (4,000-5,000 ft) with exceptional wine grape potential. Cool nights preserve acidity, intense sunlight develops complexity, volcanic soils provide drainage — but alkaline pH and low organic matter limit biological activity.

15-20%	4500'	+40%	40+
WATER REDUCTION*	ELEVATION	INFILTRATION	YEAR LIFESPAN

**Based on field trials with improved soil organic matter from 0.8% to 2.5% over 3 years. Results vary by soil type and management.*

Program Objectives

Soil Structure

Address erosion, compaction, alkaline soils (pH 7.5-8.5)

Grape Quality

Higher Brix (22-26°), improved tannins, flavor complexity

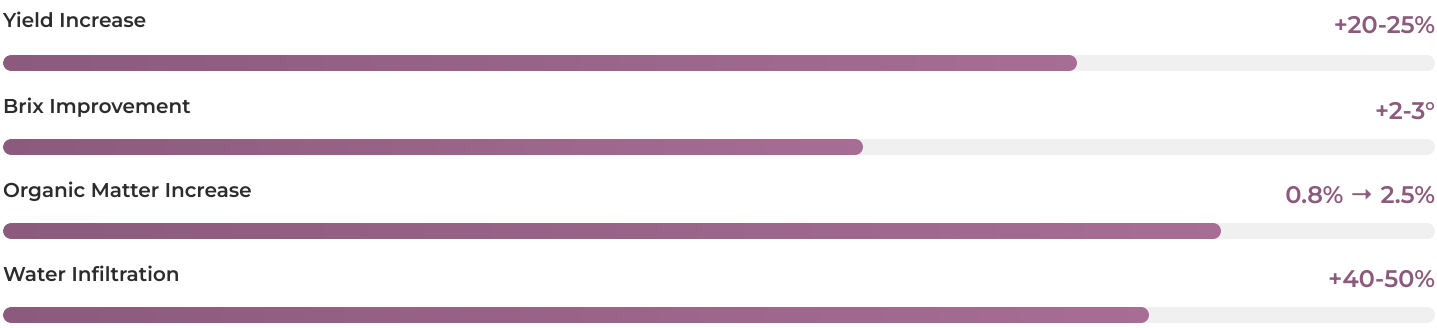
Water Efficiency

15-20% reduction through improved soil water retention

Vineyard Longevity

40+ year productive lifespan, generational value

Expected Performance Improvements



> **Why This Program Works:** Willcox's terroir is exceptional, but low organic matter (<1%) and alkaline pH limit soil biology. This program builds the biological foundation that unlocks nutrient availability, drought tolerance, and true terroir expression in your fruit.

SOIL BIOLOGY APPROACH

The Biology Protocol

Wine grapes thrive in fungal-dominant soil. This protocol builds a fungal-leaning biology (F:B ratio ~1.5:1) that regulates growth, enhances drought tolerance, and improves fruit quality—without pushing excessive vegetation.

Year 1: Three-Step Foundation

1. **Banded Compost (Under Vine Only)**
   Light ½–1" band of fully stabilized dairy compost. Provides carbon foundation and microbial inoculation.

2. **Gypsum (If Soil Test Indicates)**
   Improve Ca:Na balance and aggregate formation. Biological enabler, not a fertilizer.

3. **Surface Carbon Cover**
   Thin layer of wood chips or pruning mulch. Protects fungi from UV and reduces evaporation.

Extract Program (2-3x Per Year)

Fungal-leaning compost extract applied through drip irrigation:

EARLY SEASON	POST FRUIT SET	POST HARVEST
Root activation	Vigor regulation	Rebuild biology

Mycorrhizal Boost

Endomycorrhizal (AMF) fungi applied early season through irrigation. Improves phosphorus uptake, drought tolerance, and fruit quality expression.

> **Management Philosophy:** Wine grapes don't want force—they want balance. This program uses biology to regulate, not accelerate. The goal is long-term soil function and fruit quality, not short-term visual growth.

Smaller Berries	Water Efficiency	Balanced Vigor	Salt Resilience
Thicker skins	15-20% reduction	Not excess growth	Reduced stress

FIVE-COMPONENT SYSTEM

Key Program Components

01	02	03	04	05
Compost Blend	Wood Fiber	Tea Extract	Mycorrhizal	Bucchas Blend

Implementation Timeline

1	2	3
Dormancy Prep	Spring Activation	Growing Season
DEC - FEB	MAR - APR	JUL - AUG

Application Rates & Methods

COMPONENT	YEAR 1	MAINTENANCE	APPLICATION METHOD
Compost Blend	8 tons/acre	4 tons/acre	Banded in vine rows (12-18' spacing)
Wood Fiber	3-4" layer	1-2" top-up	Between rows, erosion control
Tea Extract	3x/season	2-3x/season	Drip zone drench (pre-bud, bloom, veraison)
Mycorrhizal	New plantings	—	1/3 blend + 2/3 native soil at planting
Bucchas Blend	2 cups/vine	2 cups/vine	After leaf-out (Apr-May)

Timeline: Year 1 builds foundation with compost and biology. Year 2-3 shows measurable soil improvements. Year 4+ achieves optimized maintenance with reduced inputs and maximum productivity.

Application rates customized based on soil test results and vineyard conditions

Capital Investment

This is not an expense — it's a capital investment in long-term vineyard productivity and land value.

Soil Asset Value
Build fertility that increases land value and productivity for decades

Production Capacity
Maximize yield per acre while elevating wine quality and reputation

Water Security
Reduce irrigation dependency 15-20% — critical for Arizona's future

Generational Legacy
Create 40+ year productive vineyards for next generation

Projected 5-Year Economics

METRIC	BASELINE	YEAR 3	YEAR 5
Yield (tons/acre)	4.0	4.8	5.0
Average Brix	22°	24°	25°
Water Use (gal/acre/yr)	100,000	85,000	80,000
Soil Organic Matter	0.8%	2.1%	2.7%

**Projected results based on field trials in similar alkaline soils with improved organic matter. Actual results vary by site conditions, management, and weather.*

Key Performance Indicators

Revenue Increase (year 5) — +25%

Input Cost Reduction — -15%

Estimated ROI — 6-8x

> **Willcox-Elgin Recognition:** As one of America's premier emerging wine regions, consistent high-quality fruit builds vineyard reputation and market value. Soil health is the foundation of terroir expression — where great wine begins.

CONTACT

soilseedandwater.com

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