



# VINEYARD DEVELOPMENT PROGRAM

## Program Description

AG-RECON has developed a series of analyses to provide high quality information and analytical tools to support better decision making in the design of a vineyard developments.

## Development Program Principles

- Vineyard development is expensive (\$15,000 - \$50,000/acre) and lasts a long time (15 - 50 years)
- The easiest time to fix a problem is *before* the vines are planted
- Make site variability work *FOR* you, not against you
- Minimizing variability within a block improves crop quality, uniformity, productivity, profitability and manageability of the vineyard.
- A \$100 - \$200/acre incremental investment in site development planning can optimize development

## Typical Development Program Benefits

- Increased crop quality and yields
- Increased return on investment on development
- Savings in development costs
- Improved economic viability and competitiveness of the property (reduced investment risk)
- Reduced overall water usage
- Reduced nutrient leaching and soil erosion
- Increased value and productivity of the property over time (improved asset value enhancement and protection)
- Improved maturity uniformity and increased harvest efficiency
- Reduced operational problems (nutrient deficiencies, pest and disease problems)
- Increased moisture/stress uniformity and improved irrigation management
- Improved ease of management of the property

## Site Variables Identified and Characterized

- Soil Fertility
- Soil Characteristics (texture, depth, pH, etc.)
- Terrain - Slope, Aspect, Elevation
- Cumulative Drainage

## Development Program Design Components to Compensate for Site Variability

- Design practical block configurations to minimize variability within a block
- Assign varieties to best suit site conditions by block
- Mitigate remaining relevant variability within each block with appropriate combinations of the following design components:
  - Selective Terrain Modification and Soil Mixing (including Reserve Soils)
  - Selective Deep Ripping or Slip Plowing
  - Selective or Differential Soil Amendments
  - Different Rootstock Assignment by area within a block
  - Variable Planting Density (within row spacing)
  - Irrigation System Design (irrigation block configuration, variable emitter spacing and type)
  - Drainage Plan (including drainage intercepts)



# VINEYARD DEVELOPMENT PROGRAM

## Program Description

AG-RECON has developed a series of analyses to provide high quality information and analytical tools to support better decision making in the design of a permanent crop development.

## Development Program Phases

- 1 Identify Site Variability
- 2 Characterize Site Variability (Targeted Sample Plans, Field Data Collection, Results Maps)
- 3 Site Design and Development Planning
- 4 Implement Development Sequence

## Development Program Phase Descriptions

### 1. Identify Site Variability

Identify site variability by mapping indicator crop variability using multispectral airborne imagery “**Crop Analysis**” and/or by identifying soil variability using **SOILMAP™**.

### 2. Characterize Site Variability

A Targeted Sampling Plan is developed based on the variability identified in Phase 1 to collect the best quality and most representative soil test samples and soil profile core samples. The results of the targeted samples are then analyzed to produce soil characteristic and soil fertility distribution maps for each variable tested (e.g. a Nitrogen Distribution Map or a Soil Total Water Holding Capacity Map). A digital elevation model is also created either from orthophotography or from GPS elevation data. These data sets provide the foundation information to create the most efficient site design.

### 3. Site Design and Development Planning

The site design phase incorporates all of the site variability information developed in the first two phases to define practical block configurations and assign varieties to minimize variability within a block. The rest of the development plans are designed to mitigate remaining relevant variability within the block. The planting density, rootstock selection, irrigation system design, terrain modification, drainage plan and soil amendment plans compensate for differences in soil depth, water holding capacity, soil fertility and cumulative drainage.

### 4. Implement Development Sequence

Development tasks defined in the Site Design can be used to manage the implementation of the site development. This information can be used to sequence interdependent development tasks.

## DIAGRAM

