

Four Essential Tests for a New Vineyard Site

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Selecting a suitable site is the most important decision when establishing or expanding a new vineyard. There are many factors involved in selecting the optimum site, and this resource provides a protocol for four essential tests that should be performed when evaluating prospective locations. Consult your regional viticulture program specialist for assistance interpreting the results of each report generated.

✓ Web Soil Survey

County soil maps have been digitized and can be accessed at no cost from the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) website. This satellite image-based survey provides the user with the specific soil series present within a designated area of interest (AOI) while giving the general soil characteristics of each soil series. This first step can help growers determine locations for detailed soil sampling and testing of the site as well as vineyard design and generalized management strategies for individual blocks.

1. To generate a soil survey for a particular parcel of land, visit websoilsurvey.sc.egov.usda.gov and click on the “Start WSS” button.
2. Enter the address of the property or GPS location, or search for it on the interactive satellite map.

The simple yet powerful way to access and use soil data.



Figure 1. Start WSS button. Source: USDA

3. Create an AOI and select the “Soil Map” tab to explore the individual soil series that are present. Doing this gives you a base reference of the soil type and diversity of a specific site and will help in determining where to collect soil samples, percolation tests, and topographical analyses, such as slope.

✓ Soil Test

Soil testing can provide critical information about a soil’s chemistry, such as pH and conductivity. Testing can also include the essential nutrient composition, including macronutrients and micronutrients, as well as organic matter content and the soil’s texture (sand, silt, and clay). Many soil testing labs will analyze soil and, at the very least, a soil test should include the pH, sodium adsorption ratio (SAR), macronutrient, and micronutrient analysis. Submitting a topsoil sample and a separate subsoil sample from each test parcel is often recommended. Remember,



Figure 2. Multiple soil series may exist within a single block as seen in this parcel of land and should be tested separately. Source: Justin Scheiner

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a soil test report for a given sample is only as good as the accuracy of the one collecting the sample. While soil testing does provide valuable information when selecting a new site, it does not tell you the soil depth, drainage, presence of soil-borne pathogens, or residual chemicals.

1. Determine how many blocks or parcels within an area of land you want to test. For example, each acre within the property could be regarded as one block, or blocking could be based on a change in soil series on the Web Soil Survey map. Each block will require one suitable soil sample container, such as a paper bag, and will be sent off as its own separate sample. Note that the laboratory will send you an individual soil report for each sample submitted.
2. Within each predetermined block, randomly select 15 to 20 sub-locations spread throughout the entire block. The goal is to get an accurate representation of the soil present.
3. At each of the 15 to 20 sub-locations, dig down to about 6 to 8 inches for a topsoil sample, depending on topsoil depth. Dig about 12 to 18 inches down for a subsoil sample. Collecting a handful is generally good enough, but make sure there is no grass or large roots—gravel is acceptable, however.
4. Place the 15 to 20 subsamples of soil in a container, such as a 5-gallon bucket. Once all of the subsamples are collected in the container, mix them well, and allow the soil to air dry in the sun.
5. Once dry, thoroughly mix the soil in the container again and collect two cups of soil, placing it in a paper bag. Fill out the required submittal form, found at soiltesting.tamu.edu/files/soilwebform.pdf, and mail it to the lab.
6. Select the analysis that will provide the desired information. Tests for new sites should be more comprehensive than routine testing, but all should be using Analysis #3 or higher. Your regional viticulture Extension program specialist can help guide you through this process and can assist with interpreting the results.

✓ Water Test

Ensuring that the source of irrigation is of adequate quality is critical for the long-term success of a vineyard. Testing of a water source for quality parameters is another necessary task that should be done

The screenshot shows the Web Soil Survey homepage with the following elements:

- Header:** USDA logo, "Natural Resources Conservation Service", and "Web Soil Survey".
- Navigation:** Home, About Us, Help, Contact Us.
- Search:** "Enter Keyword" field with a "Go" button and a dropdown for "All NRCS Sites".
- Left Sidebar:** "Browse by Subject" menu with links: Soils Home, National Cooperative Soil Survey (NCSS), Archived Soil Surveys, Status Maps, Official Soil Series, Descriptions (OSD), Series Extent, Explorer, Geospatial Data Gateway, eFOTG, National Soil Characterization Data, Soil Health, Soil Geography.
- Main Content:**
 - Welcome to Web Soil Survey (WSS):** A paragraph explaining the service and a "START WSS" button.
 - Soil surveys can be used for general farm, local, and wider area planning.** A paragraph about onsite investigation and a link to "USDA Service Center" or "NRCS State Soil Scientist".
 - Four Basic Steps:**
 - 1 Define...** "Use the Area of Interest tab to define your area of interest." Includes a screenshot of the "Area of Interest (AOI)" interface.
 - 2 View...** "Click the Soil Map tab to view or print a soil map, and detailed descriptions of the soils in your Area of Interest." Includes a screenshot of the "Soil Map" interface.
 - 3 Explore...** "Click the Soil Data Explorer tab to access soil data for your area and determine the suitability of the soils for a particular use." Includes a screenshot of the "Soil Data Explorer" interface.
 - 4 Check Out...** "Use the Shopping Cart tab to get your custom printable report immediately, or download it later." Includes a screenshot of the "Shopping Cart (Free)" interface.
- Right Sidebar:**
 - I Want To...** Links: Start Web Soil Survey (WSS), Know Web Soil Survey Requirements, Know Web Soil Survey operation hours, Find what areas of the U.S. have soil data, Find information by topic, Know how to hyperlink from other documents to Web Soil Survey, Know the SSURGO data structure, Use Web Soil Survey on a mobile device.
 - Announcements/Events** Links: Web Soil Survey 3.3.2 has been released! View new features and fixes, Web Soil Survey Release History, Sign up for e-mail updates via GovDelivery.
 - I Want Help With...** Links: Getting Started With Web Soil Survey, How to use Web Soil Survey, How to use Web Soil Survey Online Help, Known Problems and Workarounds, Frequently Asked Questions, Citing Web Soil Survey as a source of soils data.
 - Tips & Shortcuts WSS** (with a small image of hands using a device).

Figure 3. Web Soil Survey Homepage. Source: USDA

regardless of whether it is from a well, pond, tank, or municipality. The water's pH, electrical conductivity, total dissolved solids, sodium adsorption ratio (SAR), and individual sodium, chloride, and boron concentration should be evaluated, regardless of the laboratory utilized.

For well or municipality sources, locate the tap closest to the pump that will supply the vineyard and run the water for 5 to 10 minutes to ensure a fresh sample is collected.

For water sourced from ponds, lakes, or tanks, collect a sample free of debris during a time when future irrigation demand from the vineyard will be highest, such as summer in Texas.

1. For any source, fill a clean 16-ounce plastic water bottle with water.
2. Water testing submittal forms can be found at soiltesting.tamu.edu.
3. Select, at a minimum, Analysis #1 on the submittal form, and mail the sample to the Texas A&M AgriLife Extension Service Soil, Water, and Forage Lab. Again, your regional viticulture Extension program specialist can help guide you through this process and can also help interpret the results.



Figure 4. Regardless of water source, both quantity and quality should be considered before installing a new vineyard.

Source: Michael Cook

✓ Percolation Test

As grapes have little tolerance to poorly draining soils, assessing the percolation—or internal water drainage—of a site is imperative. Percolation tests should be conducted across a site, and separate tests should be conducted where soils change or topography differs. Testing should be done under normal weather conditions—not in severe drought or after heavy rainfall.

1. Select one or two locations to assess internal drainage within each predetermined block on a piece of property.
2. Dig a hole 6 to 8 inches wide and 18 to 36 inches deep, or as deep as the soil profile allows using a pair of hand-held post hole diggers.
3. Do not dig with an auger; it can seal the sides of the hole, ultimately distorting the results.
4. Fill the hole up to the top with water and check the water level every 12 hours.
5. If the water drains within 24 hours, you have suitable drainage. If it takes longer than 36 hours for a percolation hole to drain completely, you have poor drainage and either need to abandon the site or consider drainage improvement strategies.



Figure 5. A properly dug hole for a percolation test.

Source: Justin Scheiner

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