

SOIL MANAGEMENT CHECKLIST FOR AMADOR COUNTY
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SOILS VARY THROUGHOUT COUNTY

Amador County's elevation extends from 250 feet in the low foothills to more than 9,000 feet in mountainous peaks near the eastern boundary. Our discussion will be restricted to the western two thirds of the county below the El Dorado National Forest.

There are three main groups of soils in Amador County west of the National Forest:

- soils of the mountainous uplands above 2,500' elevation
- soils of the middle and lower foothills – 200' to 2,500' elevation
- soils of Arroyo Seco pediment, alluvial terraces and flood plains – 250' to 500' elevation.

Some of the characteristics of these soil groups are summarized in Appendix I. Further details are available in the Soil Survey, Amador Area, California, Series 1961, No. 26, issued September 1965.

WHAT TO DO BEFORE YOU PLANT

Recognize the unique characteristics of the soil on your parcel.

- Dig holes, look for compacted layers, clay or hardpan or bedrock that may restrict drainage.
- Read about your soil in county soils map. Many of its features are explained in detail.

Evaluate existing plants.

- Healthy native trees and shrubs usually indicate presence of good soil.
- Remove weak, diseased and overmature plants.
- Reduce the fire hazard by removing brush and thinning out trees located around the building site.

Clean up construction residue - stucco and concrete residues left in soils cause lime-induced iron chlorosis in plants.

Break up compacted layers created by heavy equipment.

Protect soil on slopes and in natural drainage ways from erosion.

PREPARING SOIL FOR PLANTING

Trees and Shrubs

Deep sandy or loam soils are the easiest for the homeowner to manage.

- Dig the planting hole large enough to accommodate roots of the tree or shrub.
- Backfill around the plants with native soil - don't add compost, amendments or fertilizer to the backfill soil.

When you have shallow soil or soils with dense clay subsoil:

-Dig several holes to determine if certain areas of the property have better drainage. Fill the holes with water or let them fill with rain water. See how long the holes hold water.

-If water drains away in a few days, fruits, or landscape trees will probably survive.

-If water lingers in holes for long periods of time, many trees and shrubs will not survive. Willows, liquidamber or alder trees are most likely to tolerate the wet conditions.

Vegetable Gardens

Deep, well-drained soils are the easiest to manage. Till the soil, fertilize, and enjoy.

Perennials such as asparagus, artichokes, bushberries and rhubarb may not succeed if soils are poorly-drained.

Irrigation-water management is a key factor if you are to succeed with vegetables on a poorly-drained soil - too much will drown the roots.

MANAGING DENSE OR POORLY DRAINED SOILS

Subsoiling, discing and plowing will improve a deep, well-drained loam soil if the surface soil has been compacted by farm animals or equipment traffic.

Clay soils tend to melt back together when they become wet after they are worked, so subsoiling, discing or plowing doesn't improve drainage or soil-air relationships.

Sandy soils also don't stay apart when worked, so subsoiling, etc. are not very effective.

Hard pan soils require extensive ripping with heavy equipment to break up the hard pan. The ripping should be done before permanent trees and shrubs are planted.

Soils with dense clay subsoils will not drain better if ripped or tilled.

Soils on steep-slopes are very vulnerable to erosion if worked and heavy rains occur before vegetation is established.

Clay soils are almost impossible to modify, but you can move them around to create a better environment for trees and shrubs, i.e., plant trees or shrubs on mounds so surface water drains away.

VEGETABLE GARDENS AND SPECIALTY LANDSCAPES

Gardeners have two choices if they have dense or poorly drained soils. Both require expensive resources (money, manpower and machinery).

1. Bring in better soil. This may be the best solution if the native soils are tough to manage.
 - Not all soils offered for sale are well-drained material.
 - Imported soil can be a source of weeds, soil-borne diseases and nematodes.
 - Try to buy sandy loam material. Try to inspect the soil before it is delivered.
2. Modify the soil.

- Build mounds of your existing soil for permanent trees and shrubs.
- Mounding allows water to run away from the base (crown) of the tree or shrubs and reduces crown root rot.
- Add sawdust or bark products.

ADVANTAGES	LIMITATIONS
<p>Sawdust and bark hold soil particles apart - create air-filled voids - provide more oxygen for roots and improve soil drainage.</p> <p>Compost performs in a similar manner but does not last as long as bark and sawdust.</p>	<p>All organic products break down over a period of time - some much faster than others. The air-filled voids gradually disappear unless the organic materials are replaced periodically.</p>

Local products that are slow to break down include redwood sawdust and bark, cedar sawdust and bark, and red fir bark.

Avoid materials which break down rapidly such as wheat or oat straw and pine or fir sawdust.

Working organic amendments into soil is difficult.

Sawdust and bark products are hard to uniformly mix with soil . When improperly done, plants will grow poorly. You can make the mix more uniform and improve your chances of success by:

- Mixing offsite (i.e.,in a cement mixer).
- Adding small increments of sawdust and/or bark to a well-tilled soil. First thoroughly till and level the soil. Add a one inch layer of sawdust/bark. Thoroughly mix the sawdust/bark mix and the garden soil with a rototiller and add successive one inch layers and till in each layer until all the amendment is added.

NOTE OF CAUTION

Poor drainage isn't corrected when a soil is modified with amendments. The dense soil below the bed will accept water very slowly or not at all. Water will back up and saturate the amended soil.

To manage this problem:

- Grow only in dry months and carefully manage the irrigation water.
- Place tile drains below the beds - surround the tile with bark/sawdust mix to keep soil from plugging the drain. Run the tiles to a low area for natural drainage or to a dry well. You may need to install a sump pump to get rid of the drainage water.

Plants in sawdust/bark amended soils need extra nitrogen fertilizer.

- Soil microbes attack the sawdust/bark as soon as it is incorporated into a soil. The microbes use nitrogen as an energy source as they attack the organic materials. Gardeners must add one pound of nitrogen (e.g., five pounds of Ammonium Sulfate (21-0-0) for each 100 pounds of sawdust/bark material incorporated into the soil to compensate for soil microbe needs. Remember to add nitrogen periodically throughout the life of the crop to provide for the crop needs.

PREPLANT CHEMICAL AMENDMENTS

Preplant chemical amendments can improve productivity of garden plants in many situations. The list below, prepared by Dr. Raymond F. Hasek, Environmental Horticulturist, U.C. Davis, is especially useful if you wish to make your own soil sawdust mixes for containers. The productivity of soil that is continuously cropped can be increased if the pH needs adjustment or if one or more of the elements are in short supply. Gardeners can easily bio assay to determine what adjustments are needed. Add a preplant chemical amendment to a small amount of soil in a container, grow radishes in the treated and in a similar container of untreated garden soil. Evaluate the plants for improvements in growth.

Possible Chemical Preplant Amendments

<u>Element</u>	<u>Source</u>	<u>Rate per 100 square feet</u>
Calcium	Calcium Carbonate	5 - 10#
	Gypsum	5 - 10#
	Treble Phosphate (0-45-0)	3 - 5#
	Superphosphate (0-20-0)	5 - 7 ½#
	Dolomite	5 - 10#
Phosphorus	Superphosphate (0-20-0)	5 - 7 ½#
	Treble Phosphate (0-45-0)	3 - 5#
	Bone Meal Raw (4-25-0)	3 - 5#
	Bone Meal Steamed (2½-25-0)	3 - 5#
Magnesium	Dolomite	5 - 10#
	Magnesium Sulfate	½ - 1#
pH Control	Material used depends upon starting pH value	
To raise pH	Calcium Carbonate	5 - 10#
	Dolomite	5 - 10#
To lower pH	Soil Sulphur	1#
	Ferrous Sulfate	1 - 3#

APPENDIX I

Mountainous Upland Soils Above 2500'

Soil depth varies from very deep, well-drained Aiken soils which produce excellent timber, walnuts, and apples to extremely shallow Mariposa soils on narrow ridge crests that overlie the tilted ends of rock strata. Soils in this area can vary significantly within horizontal distances of 50'. Average rainfall ranges from 30 to 45 inches.

Middle and Lower Foothills - 200' to 2500' Elevation

Auburn and Exchequer soils dominate much of the lower foothills west of Highway 49. Soil depths vary from 6 to 30 inches. Sticky clay subsoils also occur in many places.

Supan-Iron Mountain Soils

Soils of this association are found on flat, tabular ridges and on steep hillsides between the towns of Jackson and Amador City. Smaller areas are found between Highways 49 and 104 near Horse Creek and near River Pines at the north end of the county. Soil depth varies from moderate to very deep supan soils to shallow very stony Iron Mountain soils.

Sierra-Ahwahnee Soils

Soils of this type are mainly north of Amador City and extend to the El Dorado County line. Elevations range from 1000' to 2500'. These soils have been planted to hay, pasture, grain, wine grapes, prunes, and walnuts. They are very susceptible to erosion and must be protected when disturbed at construction sites.

Arroyo Seco Pediment, Alluvial Terrace Plateaus, Pentz-Pardee Soils, Dissected Terraces and Rolling Hills and Small Valleys with Hummocky Flats

Extends from Ione to western boundary of county. Soil depth varies widely 12" to 50". Forage yields are low unless large amounts of fertilizer are used.

Honcut-Snelling-Ryer Soils

Found on gently sloping valley bottoms, flood plains, and stream terraces of Jackson and Ione Valley. The principal soils in this association are sandy loams, fine sandy loams and silty clay loams. The Honcut soils are some of the best soils in Amador County.

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