Hydrate Project Series

HYDRATE YOUR SOIL: SOIL ENHANCEMENT WORKSHEET

Soil Resource Checklist

Category	Potential Resource	Resource Benefit	Processing Method	Notes
Water	Rainwater	Irrigation – mineral free	Passive or active rainwater systems	
	Stormwater (from landscapes, streets, etc…)	Irrigation of trees & shrubs	Infiltration basins	*not for vegetables or other plants with edible parts which contact water*
	Greywater	Irrigation of fruit trees and shrubs	Distribution system with infiltration basins	
Plant materials	Leaf litter	Fine organic material	Distributed as mulch layer or composted	
	Tree / Shrub Prunings	Coarse organic material	Chipped or pruned to short lengths and distributed as mulch layer	
	Plant cover crops	Green mulch	Mulch layer, turned into soil, composted	
	Root mass	Fine organic material	Leave in place, no-till, grow corn, buckwheat, rye, etc…	
'Waste' materials	Kitchen scraps	Organic material	Composted & applied as soil amendment	
	Animal manures	Organic material and/or fertilizer	Composted and/or applied as soil amendment	Caution – be careful with salt management and application.
	Human manures	Organic material and fertilizer	Composted and applied to soil amendment for not vegetable crops	
	Urine	Fertilizer, NPK	Diverted and diluted (min 3:1) with water, applied to plant root zones	
Other materials	Newspaper	Carbon source	Sub-surface mulch layer or shredded and composted	Caution – balance carbon with nitrogen. Once applied to soil allow a time lag to promote nutrient cycling by soil ecology
	Shredded paper	Carbon source	Composted or cover source for composting toilet	
	Sawdust	Carbon source	Composted or cover source for composting toilet	
	Wood shavings	Carbon source	Composted or cover source for composting toilet	
	Grain mash (brewing waste)	Food source	Chicken food/compost	
Sun	Light	Plant growth, warmth	Southern solar arc – leave open	
	Shade	Protection	Shade eastern, northern, and western aspects	

Soil Enhancement Planning

#	Area/Zone	Soil Needs/Issues	Potential Best Practices
Ex.	*Fruit Tree Area*	*Decompaction* *Low organic material* *No surface protection* *Lacks Moisture*	*Add deep rooted plants (i.e. wheat, native grass, etc.)* *Add composted manures* *Add surface organic mulch* *Utilize shower greywater to irrigate*
1			
2			
3			

Reference Only | Soil Assessment -- Characteristics and Indicators

Characteristic	Indicates	Method(s) to test
Texture	• Ability to retain moisture • Rate of water movement through soil • Ability to retain plant nutrients	1. Jar test. Sample soil, shake sample in jar with soap solution, allow to settle, measure and portion particle size classes 2. Flow chart "Feel Method". Sample and follow flow chart instructions
Moisture	• Effective irrigation depth (if irrigation is used) • Soil moisture storage by depth	1. Moisture meter. Determines relative moisture content by comparing with reference sample. 2. long metal rod/rebar; push through profile
Structure	• Porosity of soil to allow water and air to move through • Potential disturbances	Break off a larger piece of soil aggregate and assess structure visually using photo references to categorize
Density / Compactness	• Compaction by human activities • Decrease in rate of water movement through soil • Roots cannot easily penetrate soil	Poke soil horizon with coat hanger wire or knife to assess relative hardness. Use relative scale 1 (soft) - 10 (hard)
Organic Content (sub-surface)	• Ability to retain moisture • Increased soil fertility • Potential de-compaction of soil and structure development • Increased aeration	1. Color. Compare to reference color book and rate low to high. Organic material darkens the soil 2. Smell. Compare with high/low organic soil sample jars and rate.
pH / Effervescence	• Acidity vs alkalinity • Plant availability of nutrients • Salinity – increases alkalinity and causes clay particles to disperse	10% HCl (acid) applied with a dropper bottle. Effervescent reaction indicates level of alkalinity

Reference Only | Compost Materials: Carbon & Nitrogen Rations

Materials with high nitrogen values		*Materials with high carbon values*	
Material	**C:N (by weight)**	**Material**	**C:N (by weight)**
Urine	0.8:1	Leaf litter	50:1
Pig manure	14:1	Corn stalks	60:1
Humanure	5-10:1	Straw	80:1
Chicken manure (fresh)	10:1	Bark	100:1
Vegetable wastes	15:1	Newspaper	200:1
Grass clippings	15:1	Sawdust	500:1
Cow manure	15:1		
Coffee grounds	20:1		
Horse manure	25:1		