Compost-Based BMPs and Specifications

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

By: Ron Alexander
President, R. Alexander Associates, Inc.

3/16/21

R. Alexander Associates, Inc.
4 DECADES OF SERVICE
TO THE COMPOSTING AND ORGANICS RECYCLING INDUSTRY

Topics

- Why Compost (& Mulch) and California
- Compost and Compost Production
- Compost Benefits to Plants and Soil
- Compost and Mulch Application

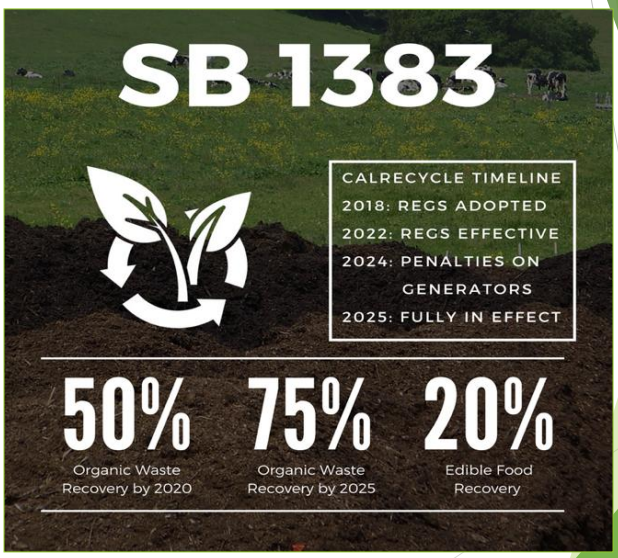
R. Alexander Associates, Inc.
4 DECADES OF SERVICE
TO THE COMPOSTING AND ORGANICS RECYCLING INDUSTRY

Related California Legislation

Major environmental drivers

Manage Short-Lived Climate Pollutants

Are procurement requirements within, so..
- Many jurisdictions will have to change purchasing habits
- Need to start adjusting landscape BMP's / specs



Slide Courtesy: Nick Lapis, CAW

Volumes Processed will Expand

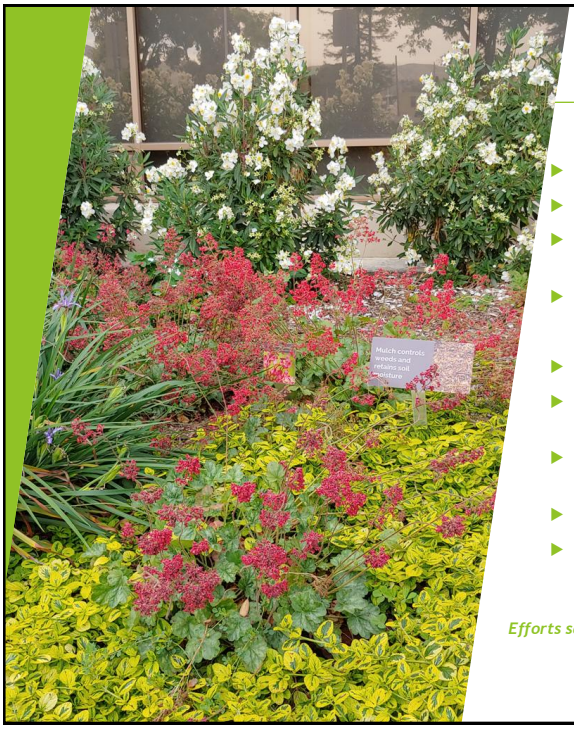
CalRecycle's Regions

Region	Tons Capacity	Tons Throughput
Bay	**2,900,000**	**2,507,000**
Central	1,052,000	661,000
Northern	243,000	140,000
Southern	5,386,000	2,306,000

Source - CalRecycle SWIS

2019 Capacity Study

- Large capacity for organics recycling
  - Actually, production capacity needs to expand
- Almost 96% processed by composters (little AD)
- Example – Southern Region - @ 5.4 Million Tons throughput capacity
  - 54% is Compost, 34% is Mulch
  - *Rest is ADC, Boiler Fuel, Other (will cease)*



Model Water Efficient Landscape Ordinance (MWELO)

- Applies to projects with 500 sf of "landscape area"
- Projects must meet a water budget
- Calculated based on plant water needs and efficiency of irrigation
- **Requires 4 CY compost / 1,000 SF**
  - **Unless already have 6% OM already**
- **Requires 3" (9 CY/1,000 SF) of mulch**
- Local, recycled compost and mulch required where available.
- Requires Soil Analysis Report be made available to designers
- CALGreen explicitly defers to WELO
- Enforced by city plan checkers and inspectors, by different departments and agencies

Efforts save water, and require compost & mulch usage

RESCAPE CALIFORNIA

Growing trends in sustainable landscaping & land mgt in California

Definition

Compost is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds, and stabilizes the carbon, such that it is beneficial to plant growth. Compost is typically used as a soil amendment, but may also contribute plant nutrients. *Current AAPFCO definition*

Is a manufacturing process

Compost / Composting

Various types of composting facilities s in California….. *Good infrastructure, expanding*

- Approximately 120 Commercial / Permitted sites, some unlicensed sites because of size / feedstock

-6 M tons managed, 20 M CY compost

-Purchase from licensed facilities

Typical Compost Feedstocks

- Yard trimmings
- Food residuals

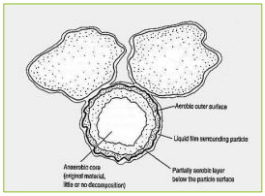
(SSO = source-separated organics)

- Manure
- Biosolids*
- Industrial by-products*
- MSW* *(Mixed solid waste)*

*Not OMRI Listable

HOW IS IT PRODUCED?

Size reduction (possible blending and moisturizing)



Surface area phenomenon

Turning for aeration (fluffing, for convection)

Commercial Compost Manufacturing

High temperature phase – kills weed seeds and pathogens

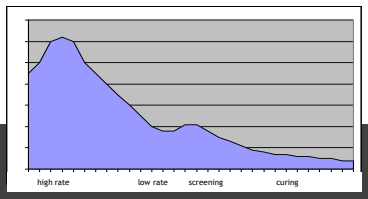
(Sanitization at 131°F for 3-13 days depending on technology)

Lower temperature phase – curing for carbon stabilization

(windrows shrink 40-50% through process)

Screen to meet application requirements

(3/8" screening is industry standard for a soil amendment)



Commercial Compost Manufacturing

Erosion Control and Storm Water Management

Coarser, mulchy composts

Soil and Water Protection Applications

Finding Compost

STA Certified Compost Participants

Use Compost » Find Compost

More in this Section...

This list/map is updated on a daily basis.

Participants are required to give customers their STA Certified Compost test results upon request.

Select a state <<

Alabama
Alaska
Arizona
Arkansas
California

d scraps

USCC Website

www.compostingcouncil.org

Z-Best Products

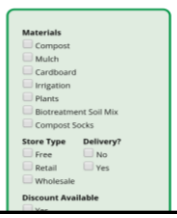
2 STA Products
980 State Hwy.25
Gilroy, CA 95020
Contact: Scotty Pitsch
T: 408-313-0444
F: 408-846-1573
Email

↑ Back to Top

Lawn to Garden Website

www.lawntogarden.org/marketplace

Offers search function
List manufacturers and distributors



Use the Right Compost !

Use and Specify

U.S. Composting Council Seal of Testing Assurance Program Participating Products

US Composting Council
Seal of Testing Assurance®

Participants, manufacturer

Certified Compost™
STA Seal of Testing Assurance
US Composting Council®

US COMPOSTING COUNCIL
Seal of Testing Assurance

Z-Best Products
Kelli Lopez
980 State Highway 25
Gilroy
CA 95020

Date Sampled/Received: 28 Oct. 19 / 28 Oct. 19

Product Identification
10.2019 Z-best Organic Compost

COMPOST TECHNICAL DATA SHEET

Compost Parameters	Reported as (units of measure)	Test Results	Test Results
Plant Nutrients	% weight basis	% wet weight basis	% dry weight basis
Nitrogen	Total N	1.0	1.6
Phosphorus	P_2O_5	0.36	0.57
Potassium	K_2O	0.78	1.2
Calcium	Ca	1.4	2.2
Magnesium	Mg	0.44	0.69
Moisture Content	% wet weight basis	37.6	
Organic Matter Content	% dry weight basis	56.2	
pH	units	7.40	
Soluble Salts (electrical conductivity 1:5)	dS/m (mmhos/cm)	5.0	
Particle Size or Sieve Size	% under 9.5 mm, dry basis	100.0	
Stability Indicator (respirometry)			Stability Rating:
CO_2 Evolution	mg CO_2-C/g OM/day mg CO_2-C/g TS/day	3.6 2.0	Stable
Maturity Indicator (bioassay)			
Percent Emergence	average % of control	86.7	
Relative Seedling Vigor	average % of control	97.1	
Select Pathogens	PASS/FAIL - per US EPA Class A standard, 40 CFR § 503.32(a)	Pass Pass	*Fecal coliform* *Salmonella*
Trace Metals	PASS/FAIL - per US EPA Class A standard, 40 CFR § 503.13, Table 1 and 3	Pass	*As,CdCrCu,Pb,Hg* *MoNiSe,Zn*

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Norm STA Laboratory Number: 9100816-1/5
Analyst: Assaf Sadeh
www.compostlab.com

BASICS - Participating Composters:

- Complete on-going product testing

  -Operate on-going sampling/testing regime, so historical product data is available

  -Using uniform sampling and analytical testing methods (from the TMECC)

  -Using only STA Program certified labs
- Disclose test data results (lab analyses) on uniform label
- Provide appropriate end use instructions to end users

Caltrans

Requires STA compost
(as do other State DOTs)

US Composting Council
Seal of Testing Assurance®

Important Parameters

Compost Parameters	Reported as
pH	N/A
Soluble salts	dS/m (mmhos/cm)
Primary plant nutrients	%, as-is (wet) & dry weight basis
Nitrogen	Total N
Phosphorus	P_2O_5
Potassium	K_2O
Calcium	Ca
Magnesium	Mg
Moisture content	%, wet weight basis
Organic matter content	%, dry weight basis
Particle size	Screen size passing through
Stability (respirometry)	mg CO_2-C/g OM per day
Maturity (Bioassay) -Percent emergence -Relative seedling vigor	 % (average) % (average)
Select Pathogens	PASS/FAIL (Per US EPA Class A standards, 40 CFR § 503.32(a)
Trace metals	PASS/FAIL (Per US EPA standards, 40 CFR § 503.13, Table 3)

HANDOUT - MORE DETAIL

Caltrans Compost Specifications

Property	Test method [a]	Requirement
pH	TMECC 04.11-A Elastomeric pH 1:5 slurry method pH	6-8.5
Soluble salts	TMECC 04.10-A Electrical conductivity 1:5 slurry method dS/m (mmhos/cm)	0-10
Moisture content	TMECC 03.09-A Total solids & moisture at 70 ± 5 °C % wet weight basis	30-60 *(40-60)*
Organic matter Content	TMECC 05.07-A Loss-on-ignition organic matter method (LOI) % dry weight basis	30-70 *(40-60)*
Maturity	TMECC 05.05-A Germination and vigor % relative to positive control	--
	Seed emergence	80 or above
	Seedling vigor	80 or above
Stability	TMECC 05.08-B Carbon dioxide evolution rate mg CO_2-C/g OM per day	8 or below
Pathogen	TMECC 07.01-B Salmonella < 3 MPN per 4 grams, dry weight basis	Pass, <3
Pathogen	TMECC 07.01-B Fecal coliform bacteria < 1,000 MPN per gram, dry weight basis	Pass, < 1,000
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Plastic, glass, and metal % > 4 mm fraction	Combined total: < 0.5% (0.25% film plastic)
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Sharps (sewing needles, hypodermic needles, etc.) % > 4mm fraction	None detected

EXAMPLE

Replace extra text with numbers / table
May modify some of the numbers

Caltrans Compost Specifications

	PARTICLE SIZING FOR	PARTICULAR PRODUCTS	
Fine compost **(for soil incorporation)**	**TMECC 02.02-B Sample sieving for aggregate Size classification % dry weight basis**	**Min**	Max
	Pass 2-inch sieve	**98%**	**--**
	Pass 3/8-inch sieve	**95%**	**--**
Medium compost*	**TMECC 02.02-B sample sieving for aggregate Size classification % dry weight basis**	**Min**	**Max**
(for erosion control blankets, native plant establishment, landscape mulching)	**Pass 2-inch sieve**	**90%**	**--**
	Pass 3/8-inch sieve (minimum 25% retained)	**40%**	**75%**
	Maximum particle length: 6 inches		
Coarse compost*	**TMECC 02.02-B sample sieving for aggregate Size classification % dry weight basis**	**Min**	**Max**
(for compost filter socks)	**Pass 2-inch sieve**	**95%**	**--**
	Pass 3/8-inch sieve (minimum 60% retained)	**0%**	**40%**
	Maximum particle length: 6 inches		

[a] TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC).

EXAMPLE ***Particle size based on end use***

Research into Erosion Control Applications and DOT Standards

Summary/Conclusion

- Lots of compost specification variation around the country
- Varying application rate
- States that completed field research had better specs

Need outreach and improvement,
Upgrade specs first

University of Wisconsin-Madison study

Can now be STA Certified

Source: TxDOT and TECQ

Not suggesting application rate changes

Compost Blankets

1-2" Depth, Onto up to 2:1 Slopes, Apply 3' Above the Top of the Slope and Into Existing Vegetation

Table 1 – Compost Blanket Parameters

Parameters[1,4]	Reported as (units of measure)	Surface Mulch to be Vegetated	Surface Mulch to be left Un-vegetated
pH[2]	pH units	5.0 - 8.5	N/A
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	N/A
Moisture Content	%, wet weight basis	30 – 60	30 – 60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 8	N/A
Physical Contaminants (man-made inerts)	%, dry weight basis	< 1	< 1

Blanket Compost Comparisons

Table 1 – Compost Blanket Parameters

Parameters[1,4]	Reported as (units of measure)	Surface Mulch to be Vegetated	Surface Mulch to be left Un-vegetated
pH[2]	pH units	5.0 - 8.5	N/A
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	N/A
Moisture Content	%, wet weight basis	30 – 60	30 – 60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 8	N/A
Physical Contaminants (man-made inerts)	%, dry weight basis	< 1	< 1

Compost Blankets – R 52

Parameters[1,4]	Reported as (units of measure)	Surface Mulch to be Vegetated	Surface Mulch to be left Un-vegetated
pH[2]	pH units	6.0 - 8.5	N/A
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	Maximum 10
Moisture Content	%, wet weight basis	30 – 60	30 – 60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing • Maximum particle size length of 6" (152mm)
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 4	<8
Physical Contaminants (man-made inerts)	%, dry weight basis	< 0.5% (0.25% film plastic)	< 0.5% (0.25% film plastic)
Maturity (plant growth compared to standard)	%, vigor and germination	>80 / 80	N/A

pH – range too wide, indicator of poor compost/ing
Soluble salts – added to un-veg'd spec to limit nutrients
Stability – Interpretation of test data changed
Inerts – Environmental pressures require clean compost
Maturity – include to assure plant growth, match other national specs

Compost Berms / Socks

Table 1 – Filter Berm and Filter Sock Media Parameters

Parameters[1,4]	Reported as (units of measure)	Filter Berm to be Vegetated	Filter Berm to be left Un-vegetated	Filter Sock Media
pH[2]	pH units	5.0 - 8.5	N/A	5.0 – 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	N/A	N/A
Moisture Content	%, wet weight basis	30 – 60	30 – 60	<60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100	25 – 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 60% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 50% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 2" (50 mm) 99% passing • 3/8" (10 mm), 30-50% passing (or 50-70% retained) Maximum: • 2"
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 8	N/A	N/A
Physical Contaminants (man-made inerts)	%, dry weight basis	< 1	< 1	<1

Berm / Sock Compost Comparisons

Table 1 – Filter Berm and Filter Sock Media Parameters

Parameters[1,4]	Reported as (units of measure)	Filter Berm to be Vegetated	Filter Berm to be left Un-vegetated	Filter Sock Media
pH[2]	pH units	5.0 - 8.5	N/A	5.0 – 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	N/A	N/A
Moisture Content	%, wet weight basis	30 – 60	30 – 60	<60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100	25 – 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 60% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 50% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 2" (50 mm) 99% passing • 3/8" (10 mm), 30-50% passing (or 50-70% retained) Maximum: • 2"
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 8	N/A	N/A
Physical Contaminants (man-made inerts)	%, dry weight basis	< 1	< 1	<1

Compost Berms and Socks – R 51

Parameters[1,4]	Reported as (units of measure)	Filter Berm to be Vegetated	Filter Berm to be left Un-vegetated	Filter Sock Media
pH[2]	pH units	6.0 - 8.5	N/A	5.0 – 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	Maximum 10	Maximum 10
Moisture Content	%, wet weight basis	30 – 60	30 – 60	<60
Organic Matter Content	%, dry weight basis	25 – 65	25 - 100	25 – 100
Particle Size	% passing a selected mesh size, dry weight basis	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 60% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 3" (75 mm), 100% passing • 1" (25mm), 90% to 100% passing • 3/4" (19mm), 70% to 100% passing • 1/4" (6.4mm), 30% to 75% passing Maximum: • particle size length of 6" (152mm) (no more than 50% passing 1/4" (6.4 mm) in high rainfall/flow rate situations)	• 2" (50 mm) 99% passing 3/8" (10 mm), maximum of 50% passing Maximum: • 2"
Stability[3] Carbon Dioxide Evolution Rate	mg CO_2-C per g OM per day	< 4	< 8	< 8
Physical Contaminants (man-made inerts)	%, dry weight basis	< 0.5% (0.25% film plastic)	< 0.5% (0.25% film plastic)	<0.5% (0.25% film plastic)

pH – range too wide, indicator of poor compost/ing
Soluble salts – added to un-veg'd spec to limit nutrients
Stability – Interpretation of test data changed
Inerts – Environmental pressures require clean compost

Why Compost?

- *Yes, some say that it is the greatest thing since sliced bread*
- Very versatile, and incredibly efficacious, product
- Most inexpensive form of stabilized organic matter available to the landscaping, vegetation and land management industries
- Again, environmental regulation is going to make more compost (and recycled mulches) available, and require its usage

LOTS…

Benefits of Compost Use to the Landscape Soils/Plants

Physical:
- Improves soil structure
- Porosity – large pore spaces
- Moisture management

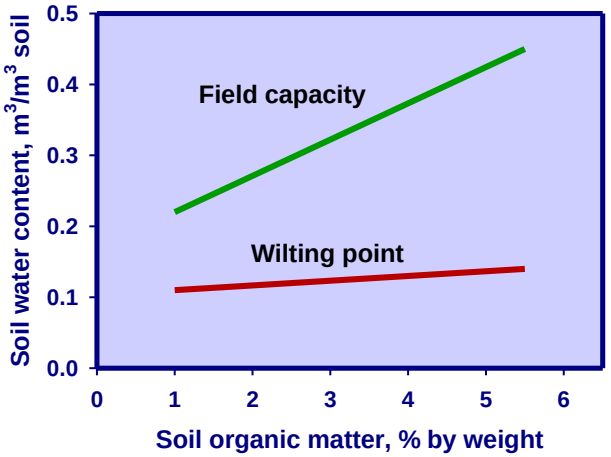
Chemical:
- Modifies and stabilizes pH
- Increases cation exchange capacity
- Supplies nutrients

Biological:
- Feeds soil biota
- Supplies soil biota
- Suppresses plant diseases

Other:
- Binds/degrades contaminants
- Binds nutrients

Keys for California >>

Effect of Organic Matter on Available Soil Water *(in soil)*



ATTRA - each increase of 1% OM can increase soil WHC by 16,500-20,000 gallons H_2O/A

Reduce irrigation 30-50% by 'fixing' the soil before planting

Improves stormwater infiltration, significantly reducing runoff

Research Shows Some Mulches Better than Others for WHC *(on soil)*

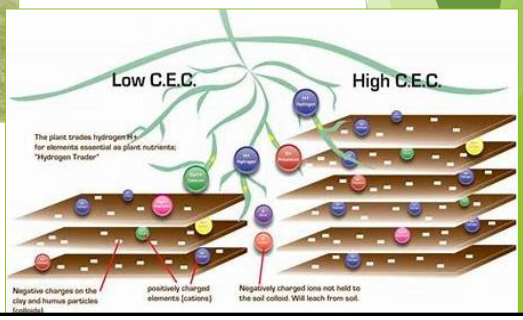
Treatment and Depth	WHC *(inches water)*	WHC *(inches water / foot appl. depth)*	Std. Dev.
Gro-Mulch - 3"	0.91	3.64	0.11
Yard waste - 5"	1.13	2.72	0.17
Yard waste - 3"	0.63	2.51	0.11
Yard waste - 1"	0.20	2.34	0.04
Composted yard waste - 3"	0.40	1.59	0.15
Fabric + OGC - 3"	0.35	1.42	0.04
OGC - 3"	0.31	1.25	0.01
Bark - 3"	0.28	1.11	0.03
Xerimulch - 3"	0.02	0.81	0.01
1" Rock - 3"	0.02	0.09	0.01
Fabric	-	-	-
Control	-	-	-

Ref: Water retention & evaporative properties of landscape mulches. Univ. of CA (Shaw, Pittenger, McMaster)

Compost Supplies Primarily Slowly Available Macro and Micro Nutrients

Reduce fertilizer application rates

Soil microbes in the soil/compost cycle nutrients back to plant



The higher the soil CEC the greater ability it has to store plant nutrients

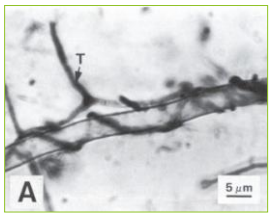
Soil CEC increases as the amount of clay and organic matter increases, and soil pH increases

Supplies and Feeds Soil Biology

Responsible for

- Organic matter decomposition and nutrient cycling
- Increased nutrient supply to plant roots
- Formation and stabilization of soil structure
- Breakdown of organic contaminants
- Control of pests and pathogens

Microbes work in symbiosis with plants, even potentially reducing pesticide usage



4 Mechanisms of Disease Suppression, via beneficial organisms:

1. Induced systemic resistance (ISR) or systemic acquired resistance (SAR) – turns on plant's natural disease-fighting mechanisms
2. Antagonism (kills/harms disease organisms)
3. Competition for nutrients (and energy)
4. Competition for root colonization

Soil Management Applications Erosion Control

- Compost Blankets
- Compost Berms
- Compost Socks
- Other

Application

Typically use specialized equipment

How the Product is Installed

Compost Blankets

Benefits:

- Intimate contact allows nearly 100% ground contact, eliminating puckering associated with other blankets
- Intimate contact reduces sediment movement
- Water infiltration increases (porous), absorbent, increasing germination of seed
- Water discharge from slopes decreases, reduces potential sediment loss
  - Often, very little water is actually discharged from the slope
- Addition of organic matter improves a slopes ability to re-vegetate and establish a permanent erosion system (extensive rooting which stabilizes the soil)
- Compost can bind heavy metals and degrade petroleum hydrocarbons in the water absorbed in the blanket

Modified from: Filtrexx International, LLC

Source: TxDOT and TECQ

Compost Blankets

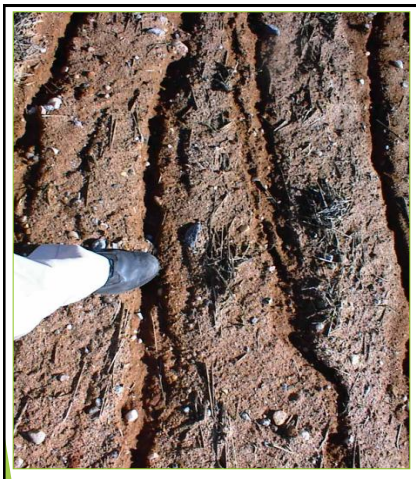
1-2" depth *(specify within spec)*,

onto up to 2:1 slopes, apply 3' above the top of the slope and into existing vegetation

USED FOR MANAGING SHEET FLOWS

- AASHTO specs exist
- US EPA supports

Compost blankets (berms and socks)



Coarse compost particles absorb rain energy, fine particles absorb water

Total / 100% contact with soil. Extensive rooting

Seeding?

Works with or without seeding, often need higher application rates

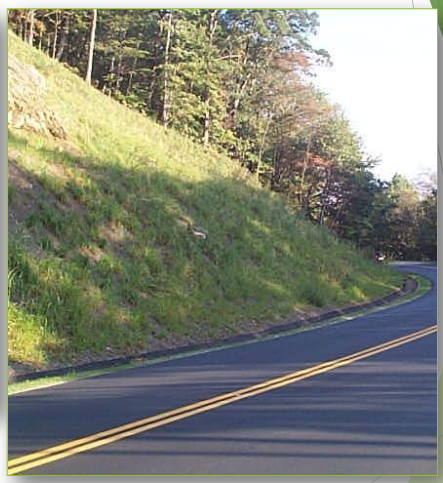
Low Slippage Factor, Naturally

Works on severe slopes

Photos by Filtrexx International

Using on Severe Slopes

1:1 slopes with 'lock down' netting



Photos by Filtrexx International

Chelan Site (trellised)

Improves seed germination, vegetation establishment

Source: WS DOT

Main Street Materials – 1:1 slope, 4” compost
Project near Lompoc

Established natives

(using mesh, extreme)

Compost Berms

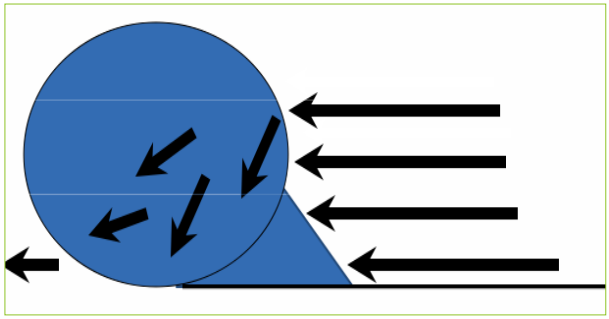
Compost applications, over time, blend in with the natural landscape

Filter Socks

Advantages:

- Can be staked into place to allow use in **concentrated flows of water**
- When filled, socks are very heavy and have good soil contact (don't have to 'dig in')
- Continuous socks can be created, unlimited length
- Are 3 dimensional, sediment is caught in the organic mass (pore spaces)
- Coarse particles allow water to flow through, while finer particles trap sediment (large capacity)

Modified from: Filtrexx International, LLC



Act as a 3-dimensional filters
-So large sediment capacity
-Ability to capture fine particulate matter

12” diameter sock, 1 year durability

18” diameter sock

filtrexx® SUSTAINABLE TECHNOLOGIES

High Capacity for Sediment

Stacking

Top, Bottom, Throughout Profile of Slopes

Staked in place or not, depending on need

Number of socks dependant on length and severity of slope

Case Study
Prunedale Improvement Project

Crazy Horse Canyon Road Interchange

Aromas Sand Soil Type

Scott Dowlan, Caltrans

Benefits of Compost

Compost promotes establishment of native grasses

Erosion Control Performance Comparisons

Bonded Fiber Matrix and Fiber Rolls vs. Compost Application

Erosion Control Performance Comparisons

BFM with and without Compost …. *Hydroseeding not enough*

50

Socks vs. Straw Wattles

Fig. 2: 12" SiltSoxx™ (97% Removal Efficiency)

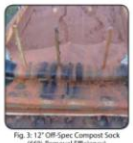


Fig. 3: 12" Off-Spec Compost Sock (66% Removal Efficiency)

Fig. 4: 9.5" Tire-Chip Wattle (69% Removal Efficiency)

Fig. 5: 10" Triangular Silt Dike (93% Removal Efficiency)

Fig. 6: 20" Straw Wattle (70% Removal Efficiency)

Compost-based technologies are almost always more effective than standard / existing technologies

Sediment Control Barrier (SCB)	Design Dia/ Height (in)	Density/Weight (lbs/linear ft)	Undermined†/ Overtopped (min)	Sediment Loss (tons/acre)	P Factor	Removal Efficiency (%)
Filtrexx® SiltSoxx™	8	10.4	28	2.6	0.18	82
Filtrexx® SiltSoxx™	12	25	NA	0.4	0.03	97
Straw Wattle	9	2.2	43†	2.8	0.21	79
Straw wattle	20	2.7	33†	4.1	0.30	70
Off-spec compost sock	12	14.7	26	4.6	0.34	66
Tire-chip wattle	9.5	16.6	23†	4.4	0.31	69
Triangular Silt Dike	10	0.5	34	0.9	0.07	93
Bare soil (control)	NA	NA	NA	14.5	1.0	0

Other Related Ideas and Applications

Storm Water Ponds

-Increasing capacity by incorporating compost into surrounding slopes

Site Restoration / Establishment of Natives (Mass Plantings / Erosion)

-Apply 4" coarse, compost
(Lifetime application)

-Vic Claassen, UC Davis research – low nutrient needs, Med climate
-Faster, denser vegetation establishment

Caltrans research found….

Deep incorporation of compost improves soil characteristics including:

- Infiltration and permeability
- Water holding capacity
- Texture
- Nutrient levels and cycling
- Micro-organism populations
- Rooting depth
- Oxygen exchange and air space
- Vegetation Coverage

53

Compost Filter Strip (10' wide) Treats Stormwater From 2 Lanes of Roadway

Parameter	Untreated Runoff	Compost filter strip treated	% Concentration Reduction	% Load Reduction
	mg/l			
TDS	52.7	55.5	-5	63
T. Phosphorus	0.089	0.26	-192	-2
COD	73.5	49.6	33	76
TSS	81	23	72	90
	ug/l			
Total Copper	28.18	9.14	68	89
Dissolved Copper	7.85	5.77	26	74
Total Lead	12.62	3.54	72	90
Dissolved Lead	0.5	0.05	90	97
Total Zinc	129.70	31.57	76	91
Dissolved Zinc	64.22	20.71	68	89

TDS=Total Dissolved Solids, COD=Chemical Oxygen Demand, TSS=Total Suspended Solids

Source: Washington State DOT (Cedar Grove yard trimmings compost)

Green Roofs

Extensive - compost (20-30%), sand, expanded aggregate

Intensive - compost (30-50%), sand, topsoil, expanded aggregate

Rain Gardens and Bioretention Ponds

Media Requirements

- 60-70% Sand v/v (is a specific sand spec)
- **30-40% Compost v/v (is a specific compost spec)**

Living or Green Walls

Wetland Creation

SUDS Drainage Area

QUESTIONS

Sponsors

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

zbest
Composting Facility

STOPWASTE
at home • at work • at school

Resources
- -Lunch & Learns
- -Short specs
- -Characteristic explanation
- -Technical assistance

Ron Alexander
ron@alexassoc.net
www.alexassoc.net
919-367-8350

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