

WSARE Producer + Professional Project

*Compost for Soil Carbon Sequestration on Irrigated
Pasture*

Compost Microbial & Nutrient Analyses

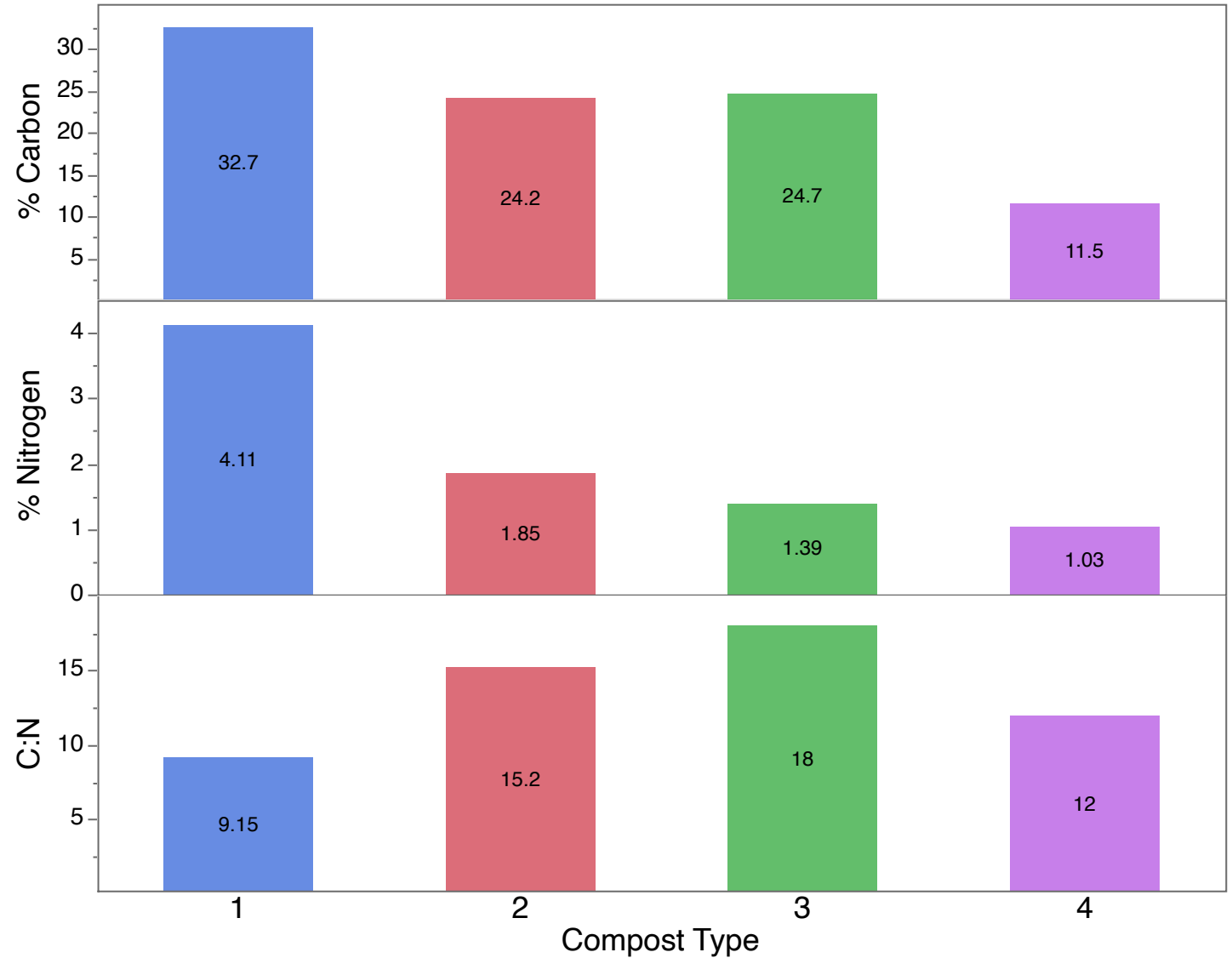
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& The Amazing Producer Group!

Compost Analyses

- What are the most important factors for determining compost quality?
- We analyzed 4 compost products for...
 - Microbial Community Composition (Fungi & Bacteria)
 - Chemical & Nutrient Content

Compost Analyses

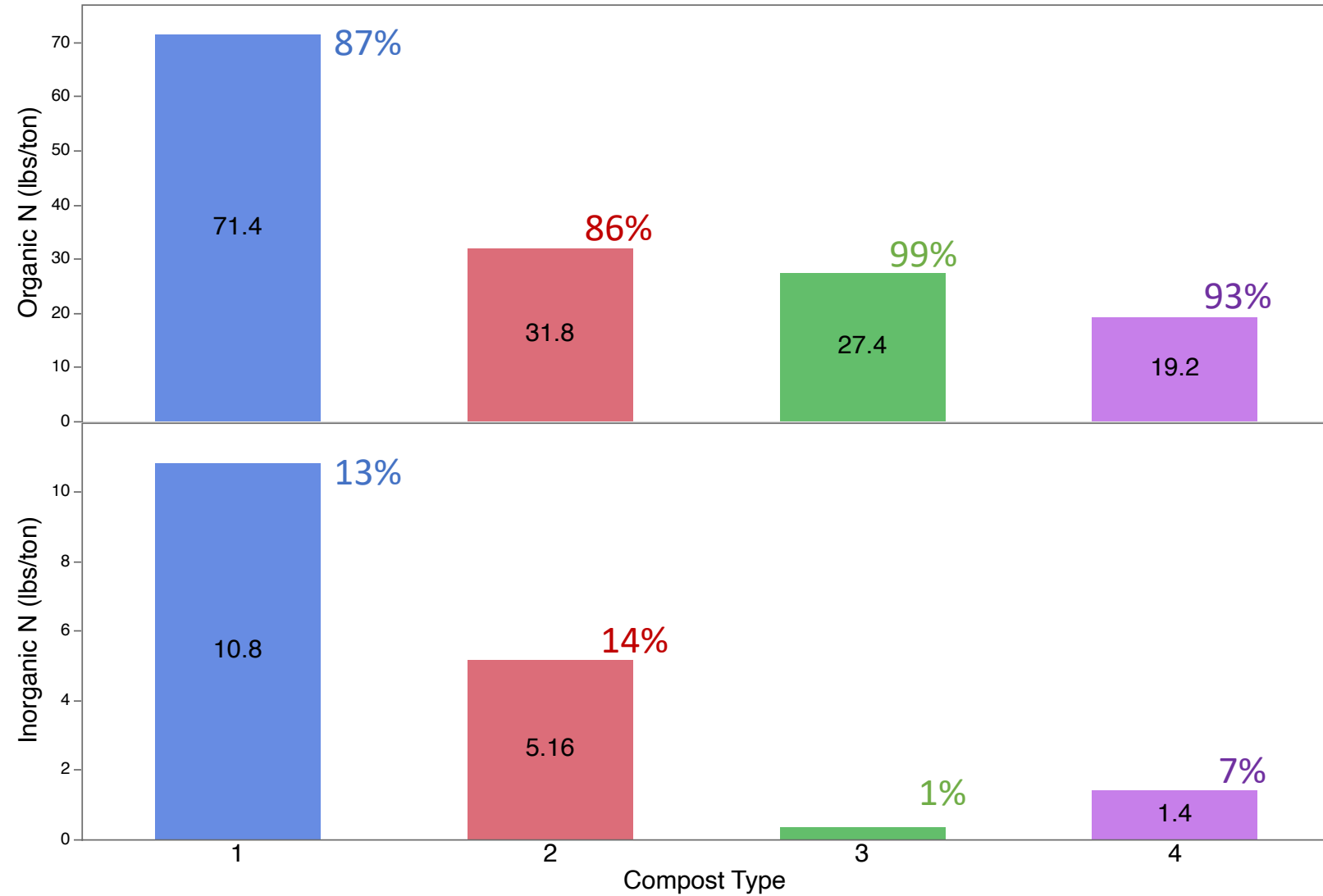
- Total C:N
 - C:N > 20 , woody composts, can increase N fertilizer requirement
 - C:N 10 – 20, less plant available N short-term, but could supply longer-term (slow-release)
 - C:N < 10, more plant N supply in short-term
 - C:N 25-40, average range of manure composts



Compost Analyses

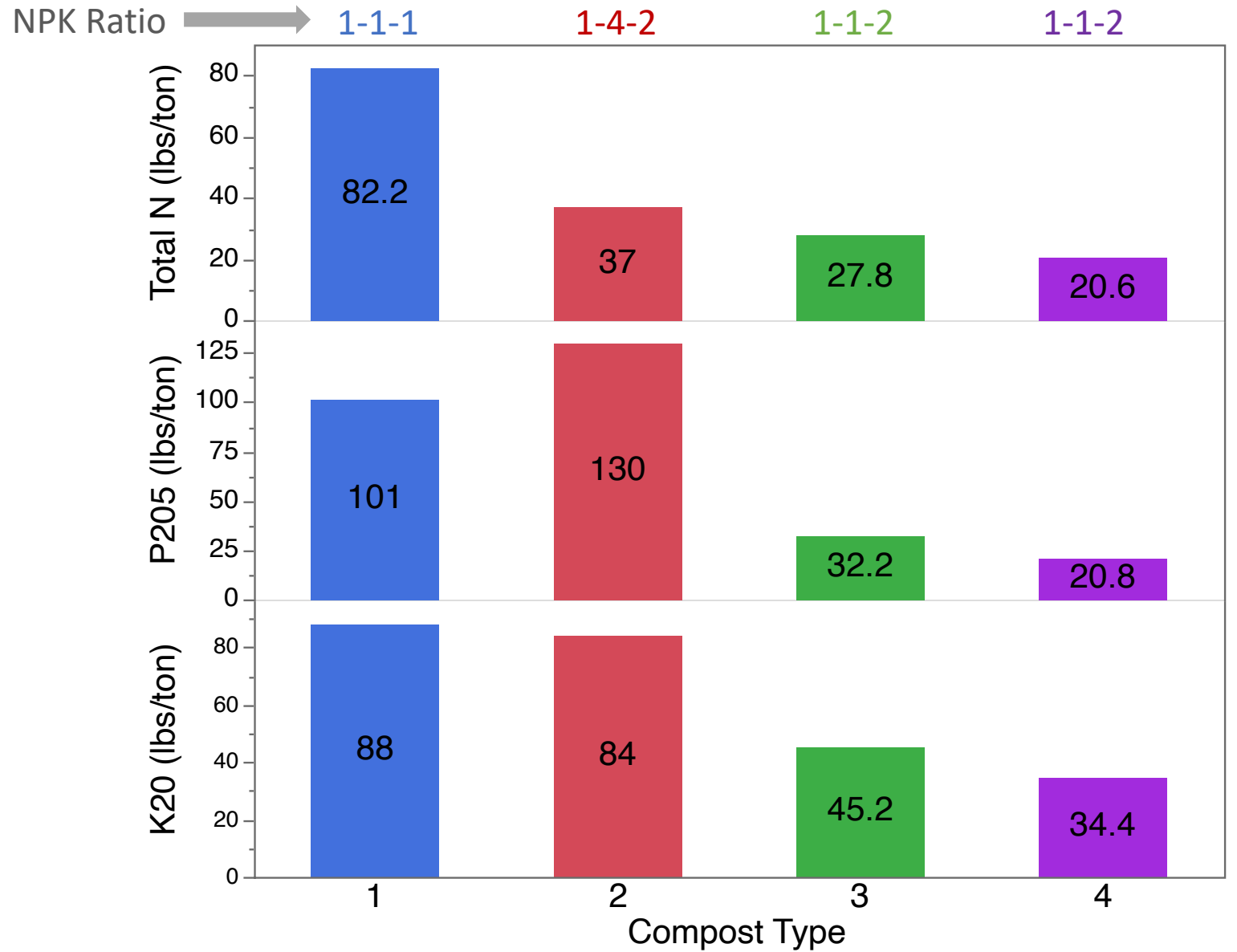
**Insert values: % of Total N*

- Nitrogen
 - Inorganic N (ammonium and nitrate) available to plants, Organic N needs active microbial decomposers
 - Most composts Inorganic N is < 5% of total N
 - Composting process temperatures can influence Inorganic N concentrations



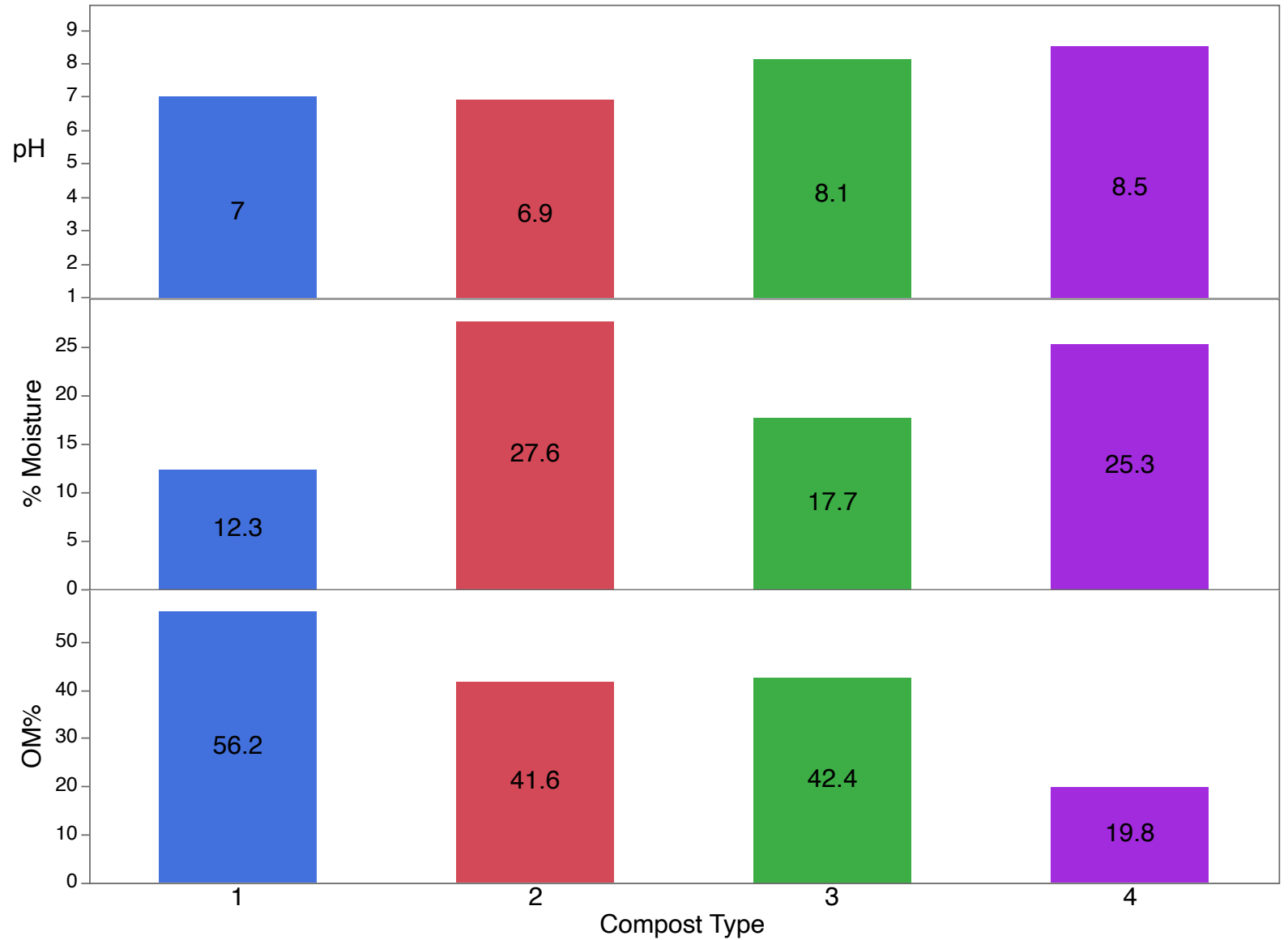
Compost Analyses

- NPK
 - Average values for compost (lbs/ton)
 - N, 24 (0-97)
 - P, 33(0-172)
 - K, 35 (0-172)



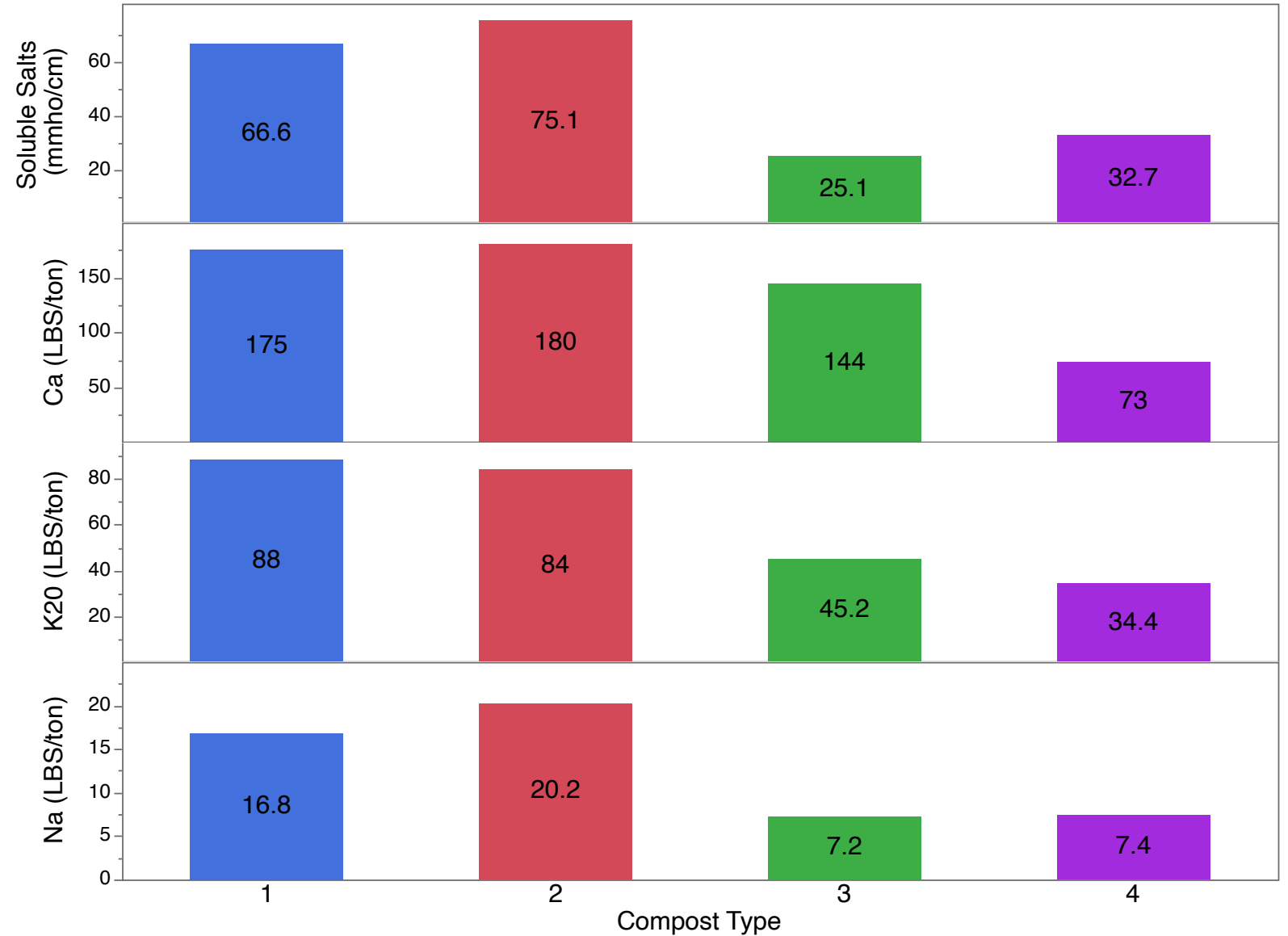
Compost Analyses

- pH
- % Moisture
- Organic Matter



Compost Analyses

- Soluble Salts
 - Calcium (Ca), Potassium (K), Magnesium (Mg), Sodium (Na)
- Indirectly Measured by Electrical Conductivity
- Average (& range) for composts (lbs/ton)
 - Salts, 29 (0-134)



Compost Analyses

- Spreadsheet for estimating Salinity of soil-compost mixture



Figure 4. Spreadsheet tool for estimating the EC_e of soil-compost mixtures.

(Double-click on paperclip symbol to reach Excel spreadsheet. Requires Adobe Acrobat Reader and Microsoft Excel.)

UC CE Estimation of Initial Compost-Soil Mixture Salinity levels

Compost Properties		Soil Properties	
Compost Application Rate (tons/acre):	8	Soil Texture Class:	Loam
Compost Salinity (EC_e , dS/m):	5.6	Soil Salinity (EC_e , dS/m):	2
Compost Moisture Content (% wet wt.):	36%	Soil Incorporation Depth (inches):	6
Compost Organic Matter (% dry wt.):	90%	Soil Organic Matter (% dry wt.):	1.0%

Estimated Compost-Soil Mix Salinity (EC_e , dS/m) = 3.1

Compost values should be from a firm a laboratory following ISTA methods.

<https://anrcatalog.ucanr.edu/pdf/8514.pdf>

Compost Analyses

➤ Microbial Community

Compost Type

DNA copies / kg soil	1	2	3	4
Total Microbial Biomass *10 ⁷	0.7	1.1	0.03	0.01
Fungi	1.7	9.8	59.4	22.8

➤ Microbial Biomass
Highest → Lowest
2 > 1 > 3 > 4

➤ Fungal : Bacteria Ratio
Highest → Lowest
3 > 4 > 2 > 1

Phases of Composting

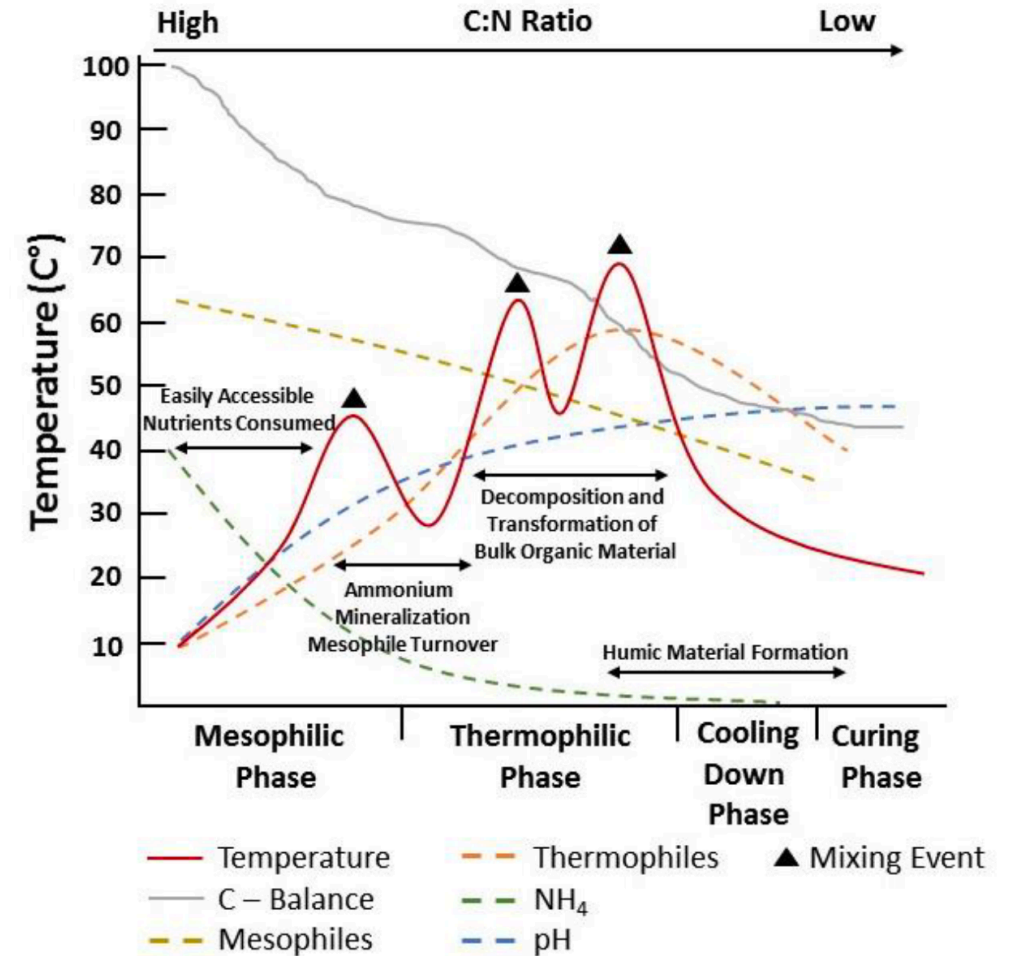


Image Adapted from Fischer 2012
(From Ward Guide)

Other Resources

**Click on title to access document via a hyperlink*

- [Diagnosing Saline and Sodic Soil Problems](#)
- [Best Management Practices for Manure Utilization](#)
- [Interpreting Compost Analyses](#)
- [Choosing a Soil Amendment](#)
- [A Review of Soluble Salts in Compost](#)
- [Compost Application Rates for California Croplands and Rangelands for a CDFA Healthy Soils Incentives Program](#)
- [Assessing Compost Quality for Agriculture](#)
- [Ward Laboratories Guide](#)