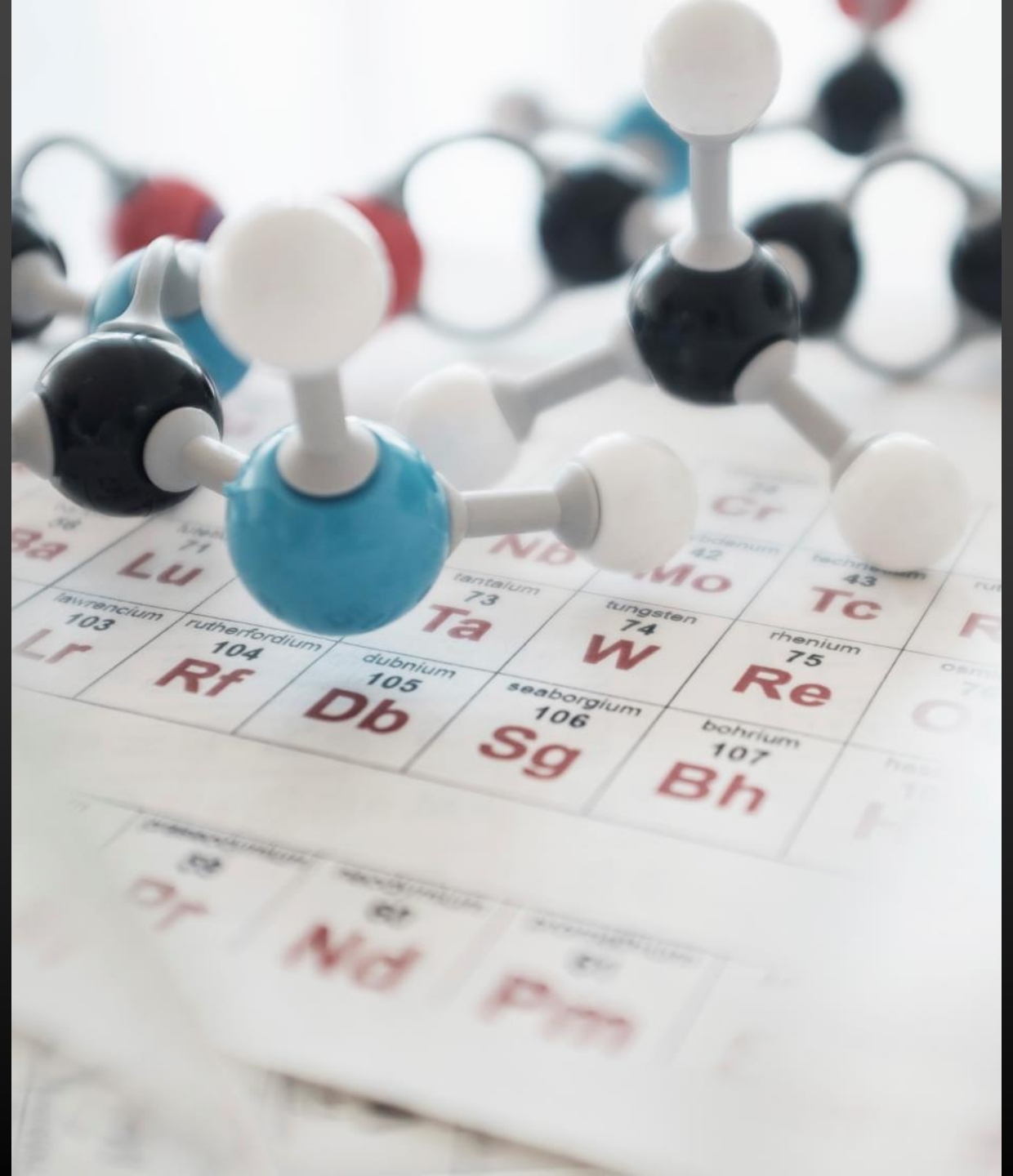




UCRRA Compost Technical Data Guide

updated July 2020



Our compost has been sampled and tested as required by the STA certified compost program of the US Composting Council. Full test results are available at www.ucrra.org or by contacting us at 845-336-0600. The US Composting Council makes no warranties regarding this product or its contents, quality, and suitability for any particular use.

Our compost has been tested by certified agronomy laboratories:

AgroLab www.agrolab.us



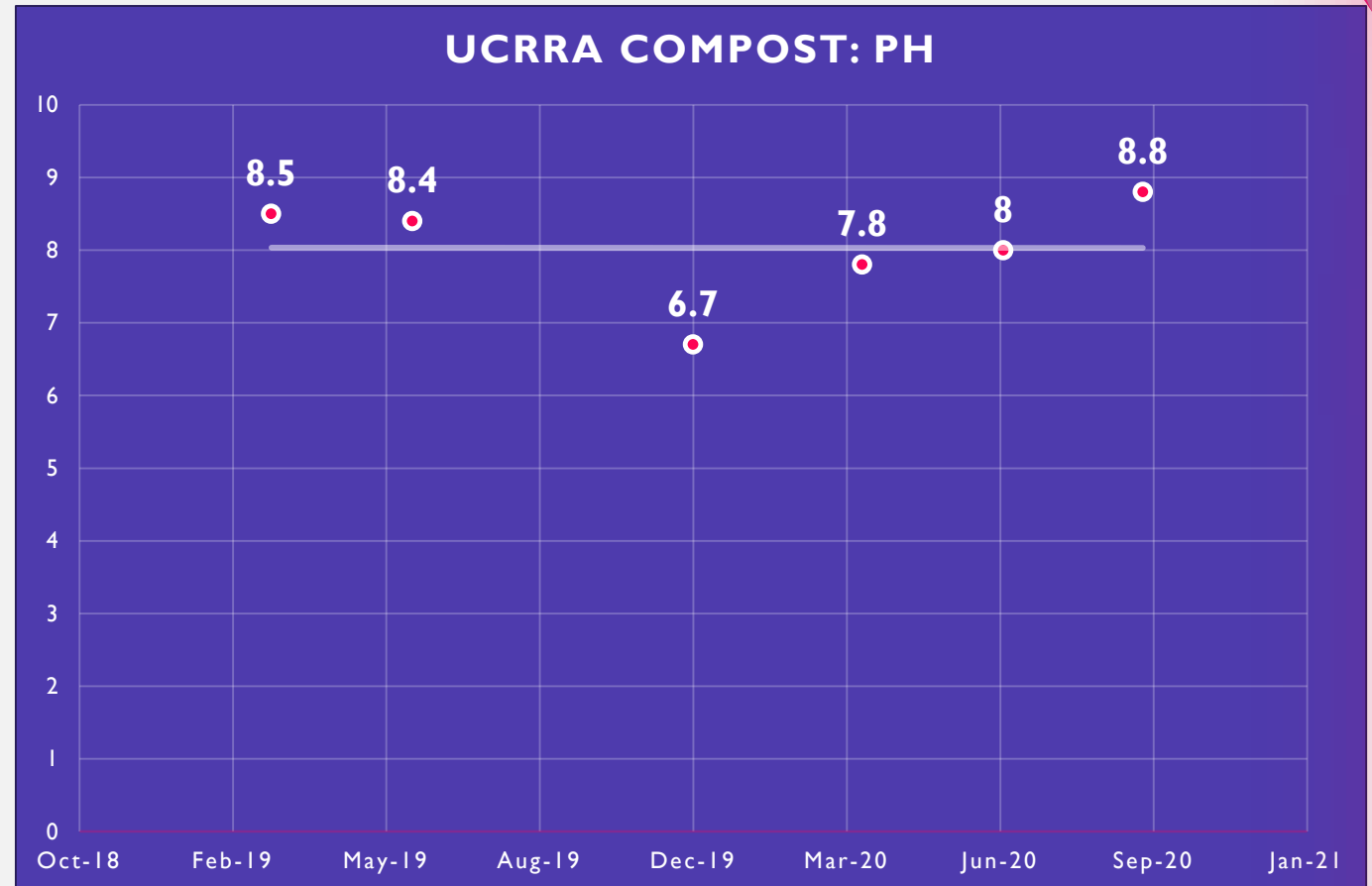
Works Cited

- *Interpreting Compost Test Results*. February 2014. Prepared by Tracy Allen, Laboratory Supervisor. UMASS Extension Soil & Plant Tissue Testing Laboratory. Ref No. SPTTL_8
- *Testing Composts*. 2004. Prepared by Jean Bonhotal, Director of Cornell Waste Management Institute. Department of Crop and Soil Sciences, Cornell University. CWMI Fact Sheet #4
- *Interpreting Compost Analysis*. October 2018. Dan M. Sullican et. Al. Oregon State University Extension Service. EM9217
- *Potassium in the Soil. Sulfer in the Soil. Calcium in the Soil*. North East Farming Association. Web accessed July 2020. WWW.NOFA.ORG
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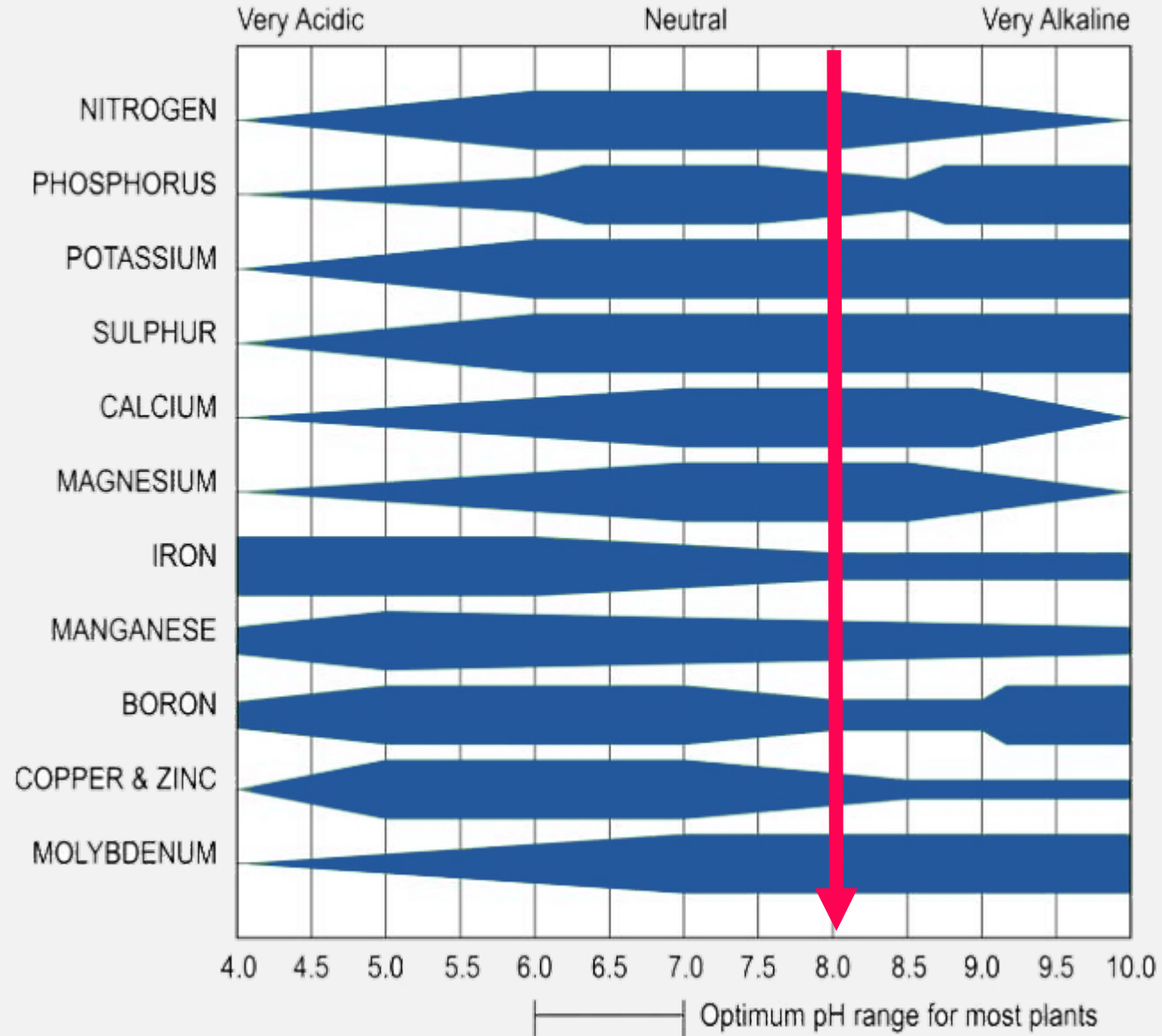


Compost pH

- pH is a measure of acidity/alkalinity. Ideal range for most plants is slightly acidic to neutral (6.5-7.0) – Cornell Waste Management Institute
- The pH of finished compost should be near neutral, though values between 6 and 8 are common. – UMASS Extension Soil & Plant Tissue Testing Laboratory
- Most plant-based composts are moderately acidic to moderately alkaline (pH 6.0-7.5) – Oregon State University Extension Service

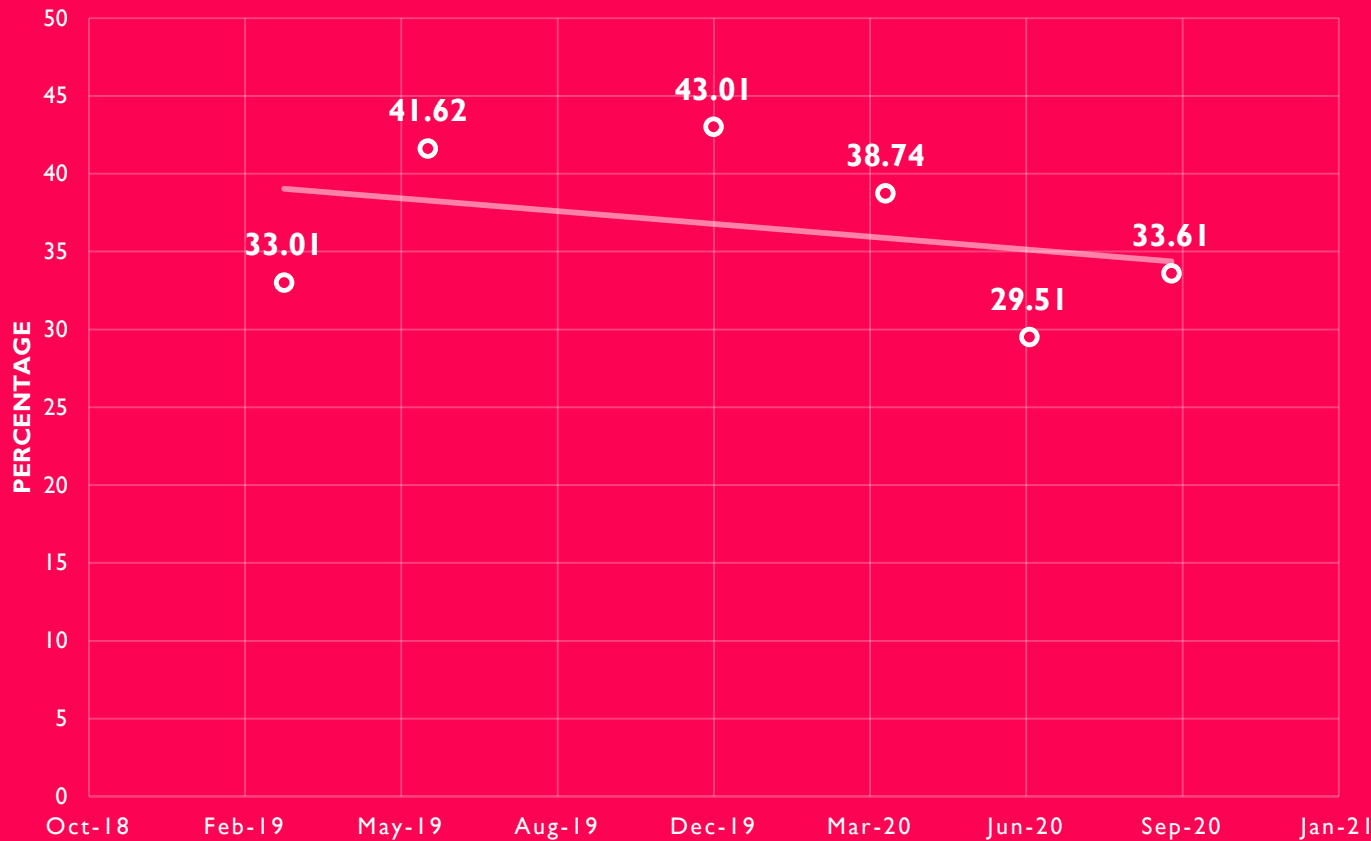


Nutrient Availability Through the pH Scale



Compost Organic Matter (OM)

UCRRA COMPOST: % ORGANIC MATTER



- OM content is the measure of carbon based materials in compost and is typically expressed as a percentage of dry weight. OM is determined by loss of ignition at 550 degrees C. OM can indicate the nature of the starting materials and the degree of decomposition. Most finished composts tested by this laboratory have a 25-40% OM. There is no ideal OM for finished compost, but near 30% is common. The remaining 70% is mineral matter and ash. –
UMASS Extension Soil & Plant Tissue Testing Laboratory



The Value of Organic Matter in Soil

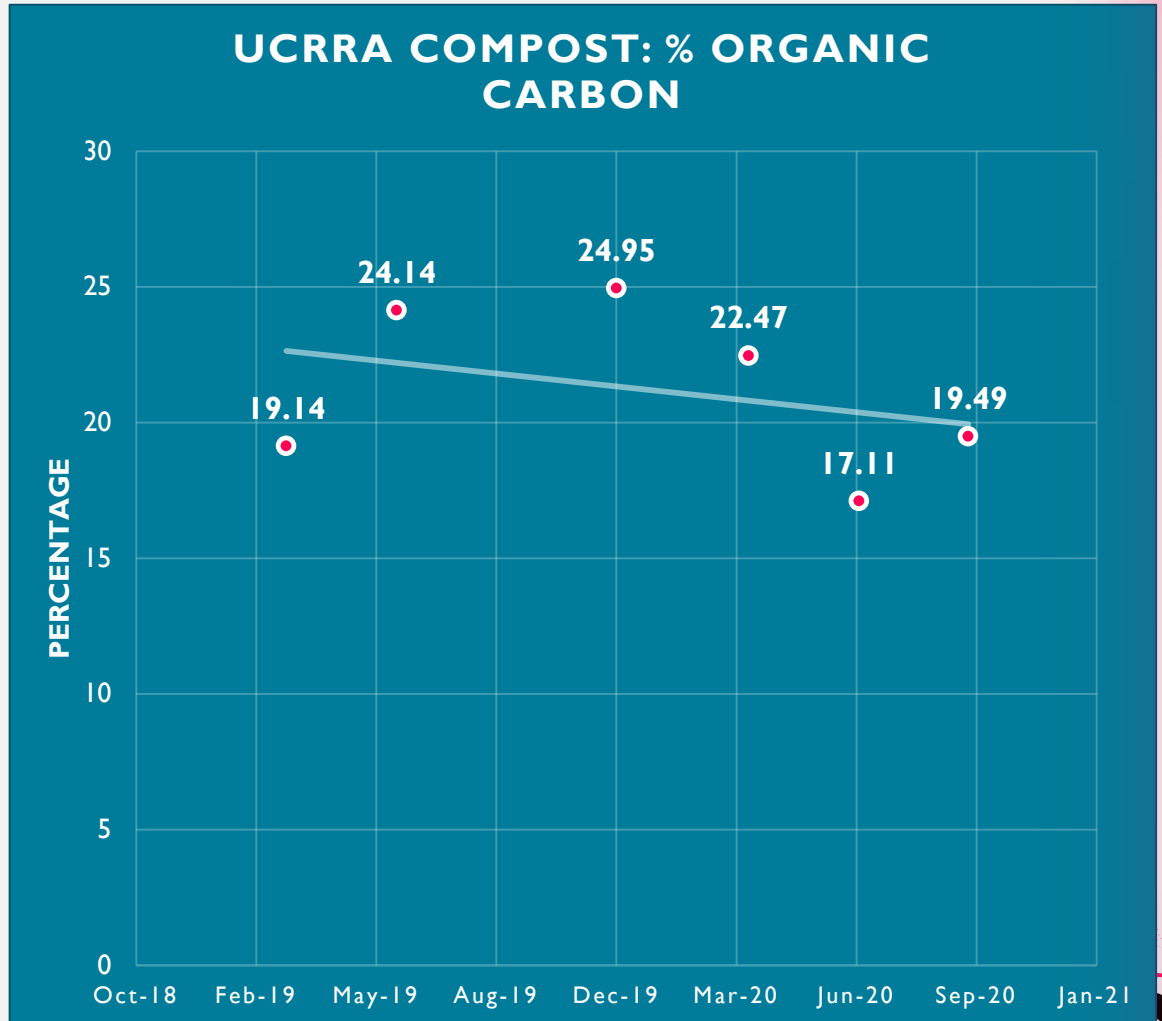
OM improves soil structure:

- Creates stable, granular soil aggregates and pore spaces
- Increases both water retention and drainage
- Increases the amount of air within the soil aggregates
- Provides space for biomass, the beneficial soil organisms (fungi, bacteria, nematodes, earthworms, insects, and others)



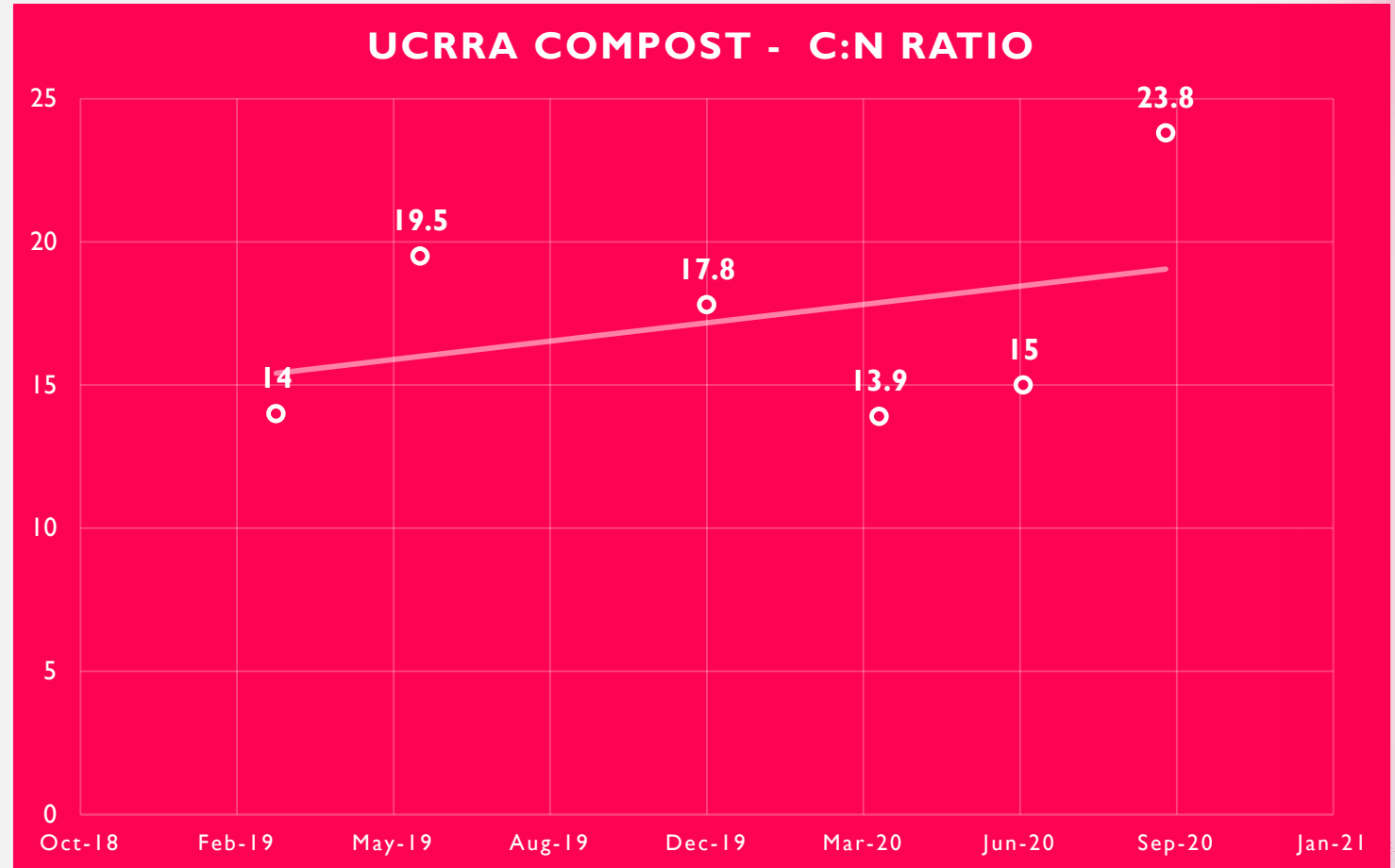
Organic Carbon

- Total organic carbon (TOC) is the carbon stored in soil organic matter (OM). Soil Organic Carbon (SOC) is the main source of energy for soil microorganisms. The ease and speed with which SOC becomes available is related to the SOM fraction in which it resides. SOC is one of the most important constituents of the soil due to its capacity to affect plant growth as both a source of energy and a trigger for nutrient availability through mineralization. - National Soil Survey Center, University of Illinois.
- Organic carbon represents about half of the organic matter weight. If you know the organic C content you can estimate total organic matter content. For example, a compost with 25% total organic carbon contains about 50% organic matter. – Oregon State University Extension Service



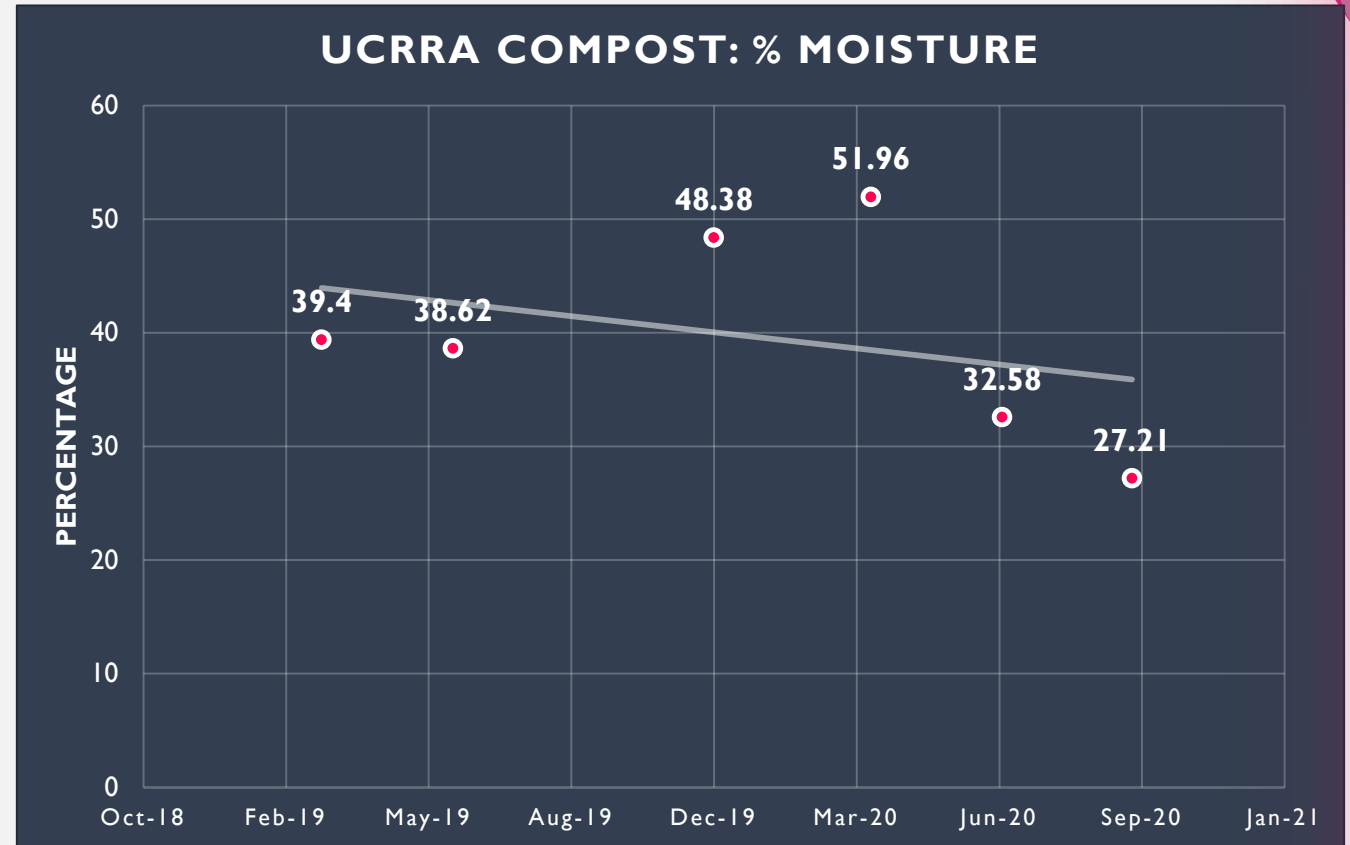
Compost Carbon-to-Nitrogen Ratio

- C:N ratio is the relative proportion of total carbon to total nitrogen in the compost. A 'typical' compost recipe may start with a C:N of about 30:1 but as composting proceeds, microbes in the mixture use the carbon substrates as their energy source, oxidizing it and releasing it as carbon dioxide gas. Assuming that nitrogen is conserved in a moist, well-aerated pile, the C:N ratio decreases with time. Depending on the ratio of starting materials, a final ratio of about 15-20:1 generally indicates a finished, mature product. – UMASS Extension Soil & Plant Tissue Testing Laboratory



Moisture Content (MC)

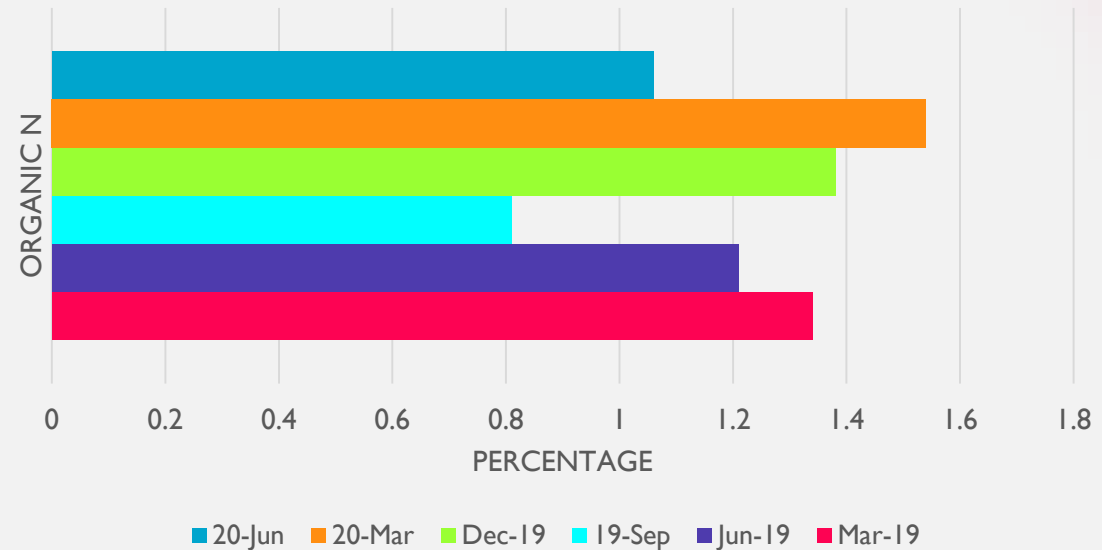
- Compost moisture is expressed as a % of compost wet weight. High moisture composts (above 60%) are usually clumpy and difficult to spread. Low moisture composts (below 40%) are dusty. The higher the MC the lower the amount of OM per ton of compost. – Oregon State University Extension Service
- MC reflects the state in which the sample was received by a laboratory and may have limited significance. Compost containing a high % of OM will have a high water holding capacity and high moisture content. – UMASS Extension Soil & Plant Tissue Testing Laboratory
- Moisture content changes over time as organic matter breaks down. – Cornell Waste Management Institute



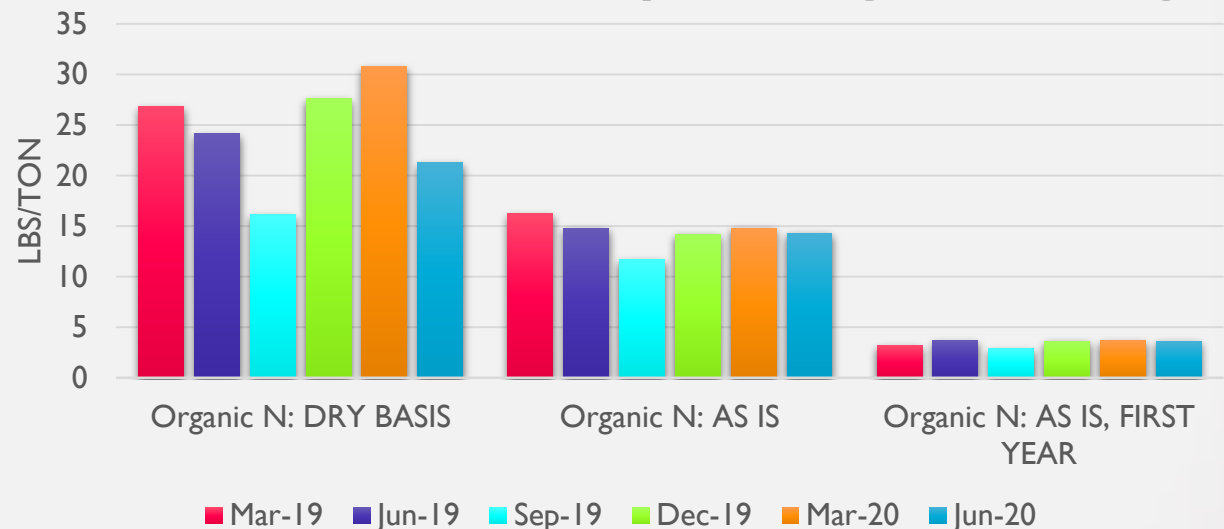
Organic Nitrogen

- Organic N is the fraction of the total nitrogen that's chemically associated with carbon in some form in mature composts. Organic N should explain most of the total nitrogen present. It is determined by subtracting the inorganic N forms from the total N. Evaluating the availability of that N to a crop is more difficult. – UMASS Extension Soil & Plant Tissue Testing Laboratory
- Organic N is converted into plant available forms by microbial activity in the soil. Thus, compost application to soil can replace some of the usual N fertilizer inputs for crop production. Oregon State University Extension Service

UCRRA Compost: Organic N %



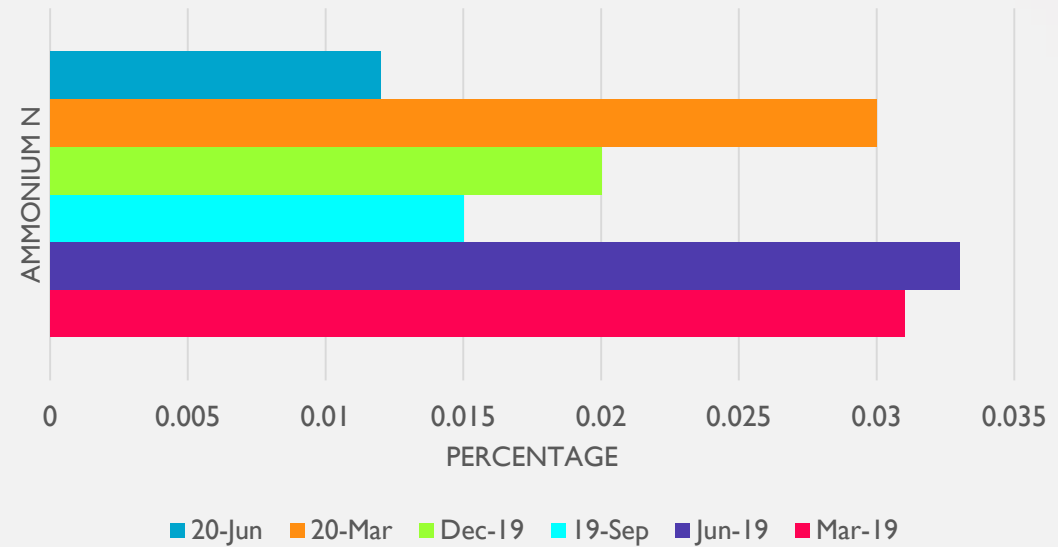
UCRRA Compost: Organic Nitrogen



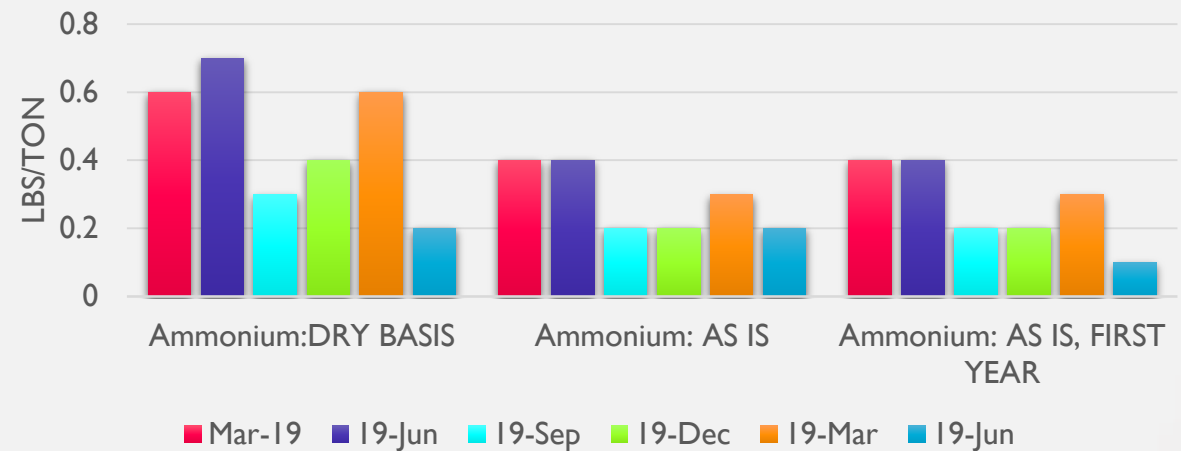
Ammonium N

- Ammonium-N is a common mineral form of nitrogen in compost. Ammonium-N levels in well managed composting operations are usually low (<100mg/kg). High levels indicate poor aeration, excessively wet conditions, or N-rich starting materials. High levels at high pH can result in gaseous loss of N which can damage sensitive plants– UMASS Extension Soil & Plant Tissue Testing Laboratory
- Sometimes called plant-available N, Ammonium-N are soluble inorganic ions that are released as organic N. In most composts, inorganic N is usually less than 5% of total N. – Oregon State University Extension Service

UCRRA Compost: Ammonium N %



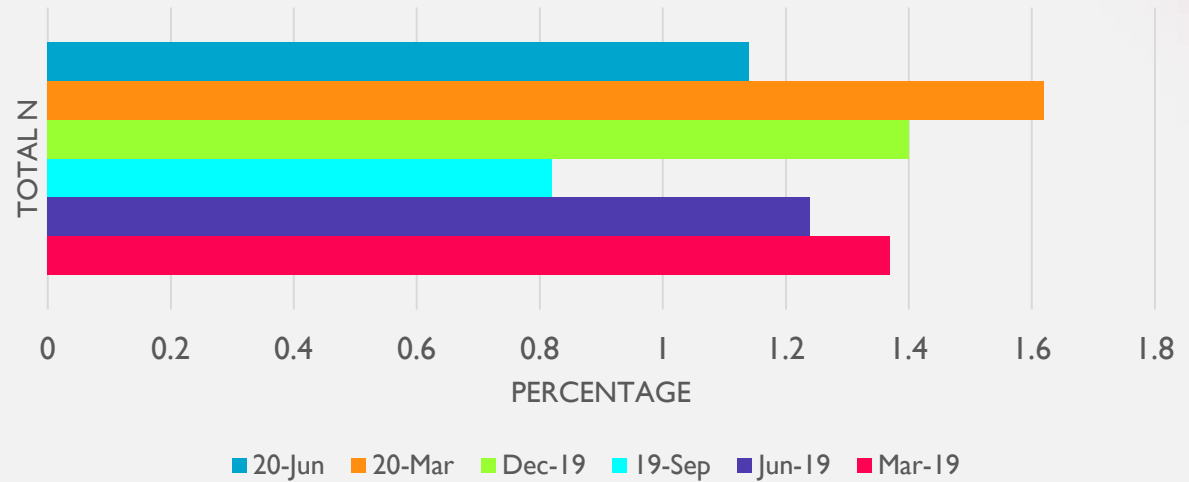
UCRRA Compost: Ammonium



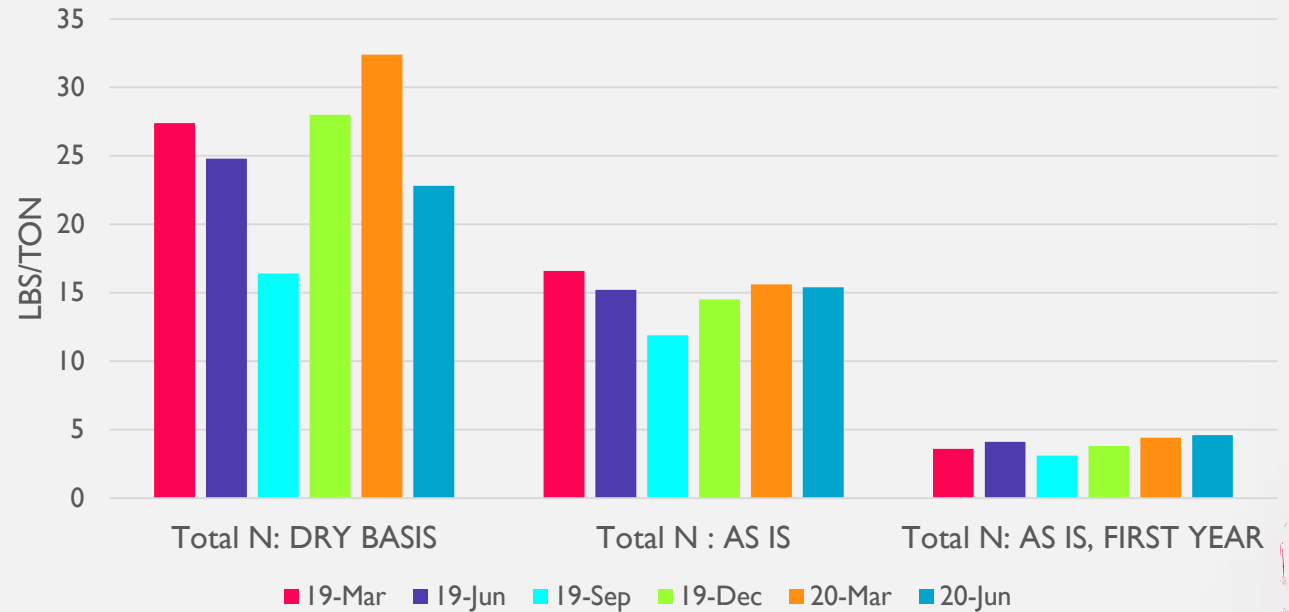
Total Nitrogen

- This value indicates both organic and inorganic forms of nitrogen in compost. In mature composts, most nitrogen should be organic, which indicates a compost is mature. – Cornell Waste Management Institute
- Most compost contains about 1% total N on a dry weight basis (~7lbs/cy). This means that an application of 50 dry tons per acre would add 1,000 lbs N per acre. If the compost is finished, one can assume that 10% of the total N will become available during the first year of application– UMASS Extension Soil & Plant Tissue Testing Laboratory

UCRRA Compost Total N %



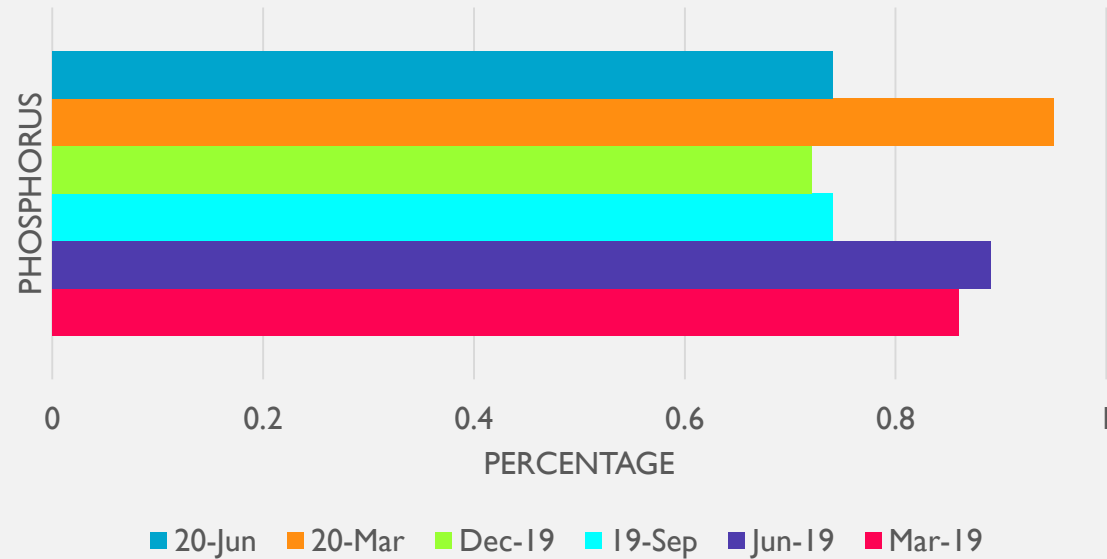
UCRRA Compost: Total Nitrogen



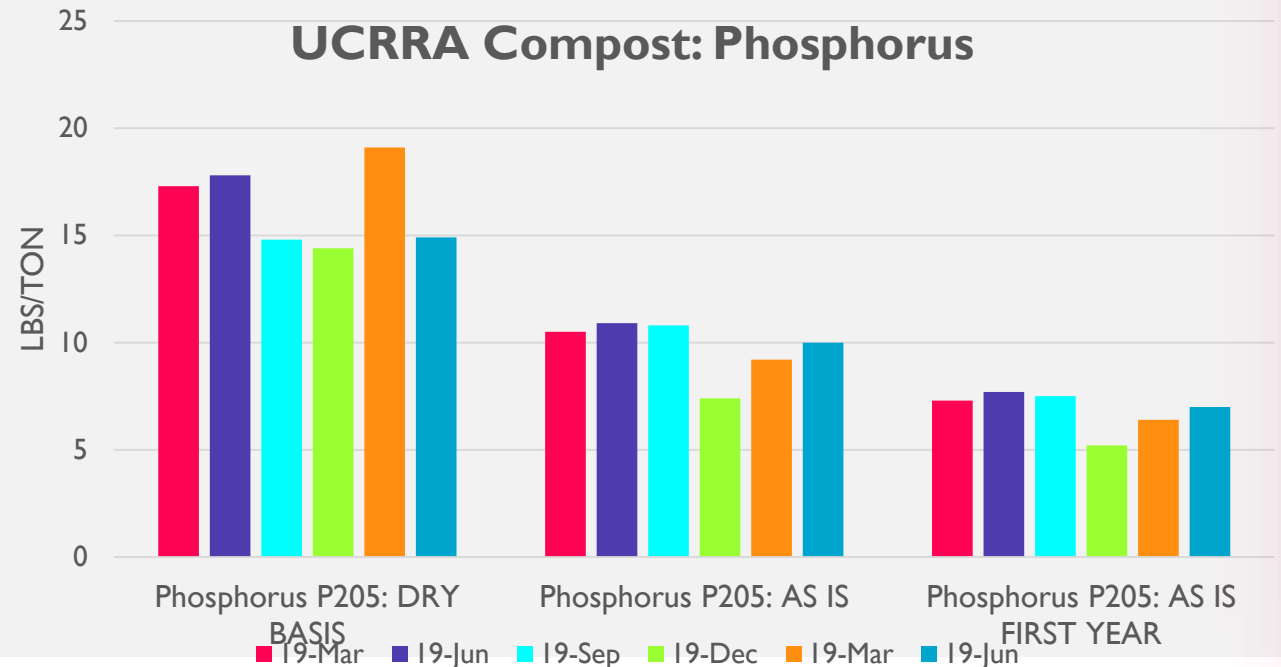
Phosphorus

- Compost supplies macronutrients (like Phosphorus) that are important for plant nutrition. If compost contains 2% of a nutrient on a dry basis, a dry ton of compost will supply 40 lbs. of that nutrient. – Oregon State University Extension Service
- Values given indicate the total nutrient value of the compost sample. It has been estimated that 50% of P, Ca, and Mg, and 85% of K are available in the first season of application. - UMASS Extension Soil & Plant Tissue Testing Laboratory

UCRRA Compost Phosphorus %



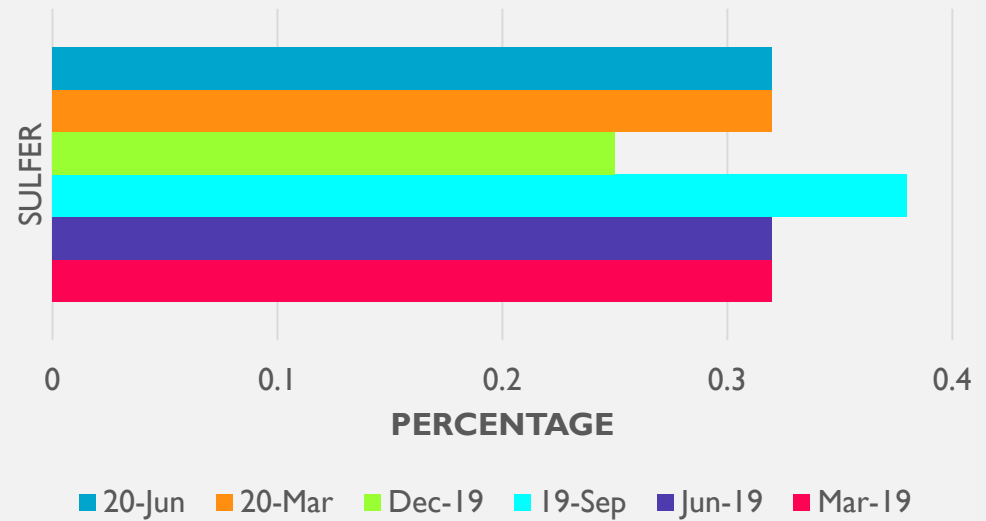
UCRRA Compost: Phosphorus



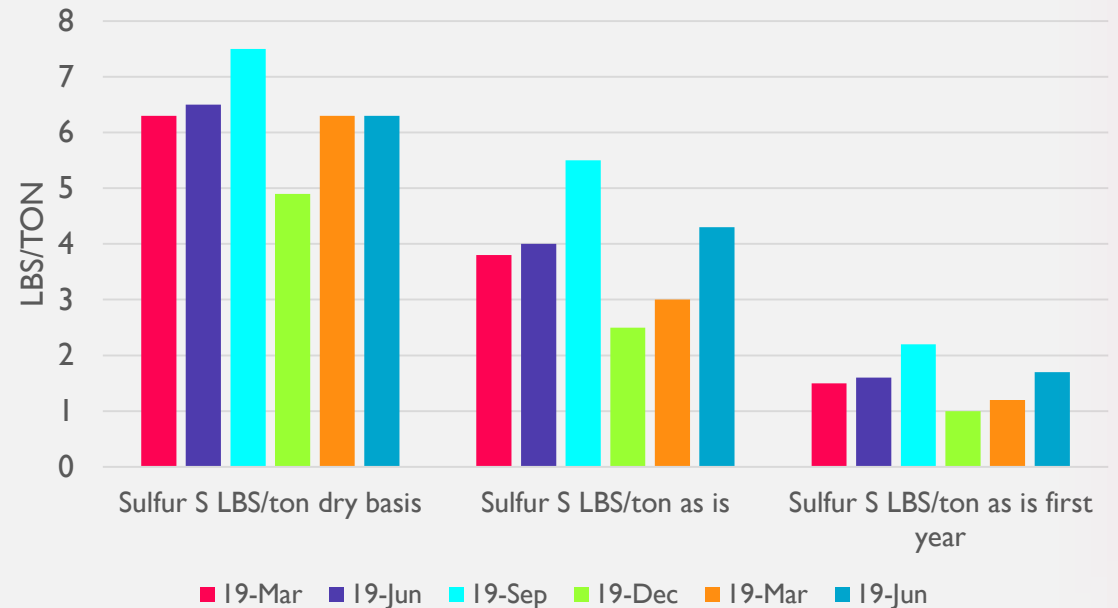
Sulfur

- ...In some respects, the properties of sulfur in the soil are intermediate between those of the other major nutrient anions, phosphorus and nitrogen. Sulfur, like phosphorus but unlike nitrogen, is found in soil minerals, and, as the soil weathers, it becomes available in the form of sulfate ions...
- Sulfur is an essential ingredient in some amino acids, but not all. However, amino acids which contain sulfur are necessary for all proteins, and a deficiency of sulfur will block the synthesis of proteins in plants. The use of most organic residues or any sulfur-containing fertilizer in an amount necessary to satisfy other nutrient requirements will suffice also for sulfur.....
-most vegetable crops remove about 15-30 lbs of sulfur per acre. Where rainfall is high, we might increase that amount by about 50% to estimate the need. Northeast Organic Farming Association

UCRRA Compost Sulfur%



UCRRA Compost: Sulfur

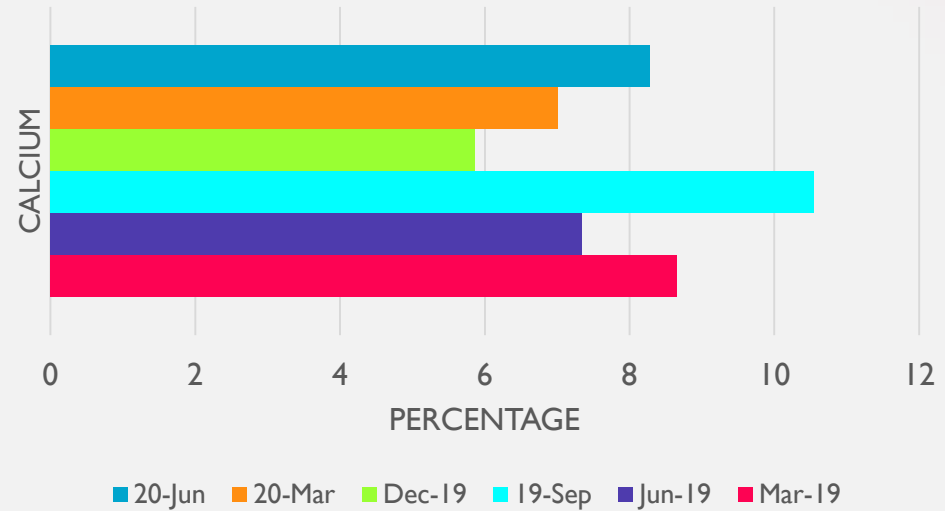


Calcium

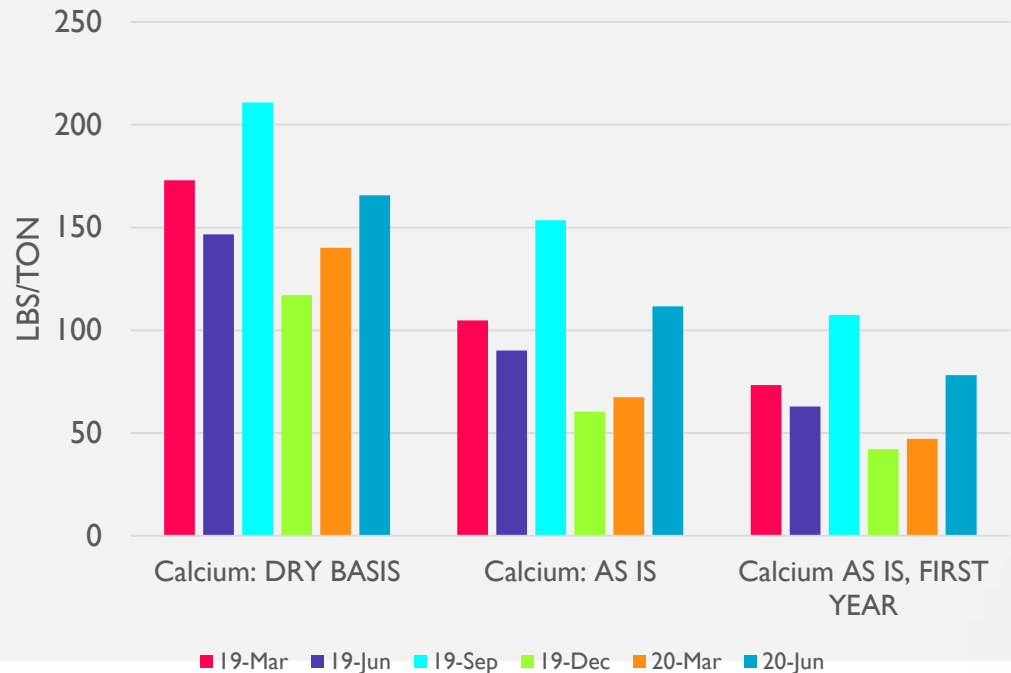
-Calcium has two major effects in the soil. One is as a bonding agent in the aggregation of soil particles, wherein it helps to bind organic and inorganic substances. It is important in the development of a good soil structure. Secondly, it acts as a nutrient filler, to maintain balance among nutrients and occupy space which otherwise would be taken up by acid elements.
- ...Except under conditions of severe calcium deficiency, no relation exists between the amount of calcium in the soil and the amount in a plant. Furthermore, like potassium, soil organisms require little calcium....

-Northeast Farming Association

UCRRA Compost: Calcium%



UCRRA Compost: Calcium

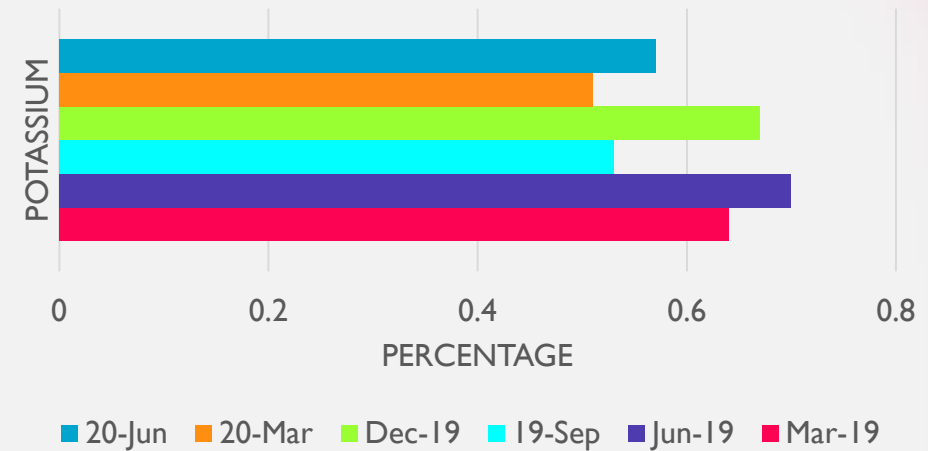


Potassium

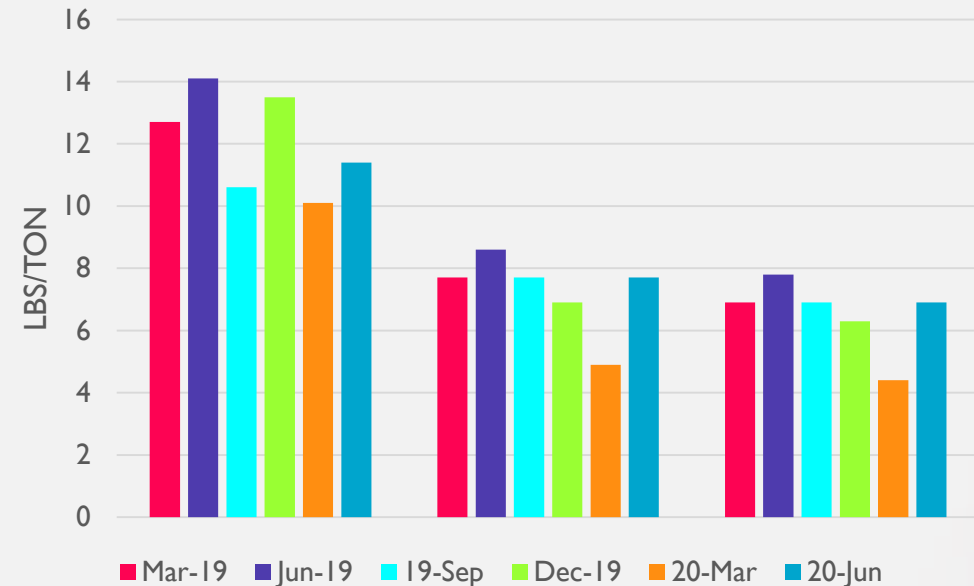
- Soil organisms have a much lower requirement for potassium than plants do. Consequently, as organic residues decompose, most of the potassium is quickly released. The behavior of potassium in the soil is determined more by physical than by chemical or biological processes.....
- Potassium is highly mobile in the soil, but leaching is minimized by cation exchange and by trapping within clay crystals.....
-Biennials and perennials especially require a sufficient supply of potassium in order to synthesize the starches necessary to carry the plants through winter.

-Northeast Farming Association

UCRRA Compost: Potasium %



UCRRA Compost: Potasium

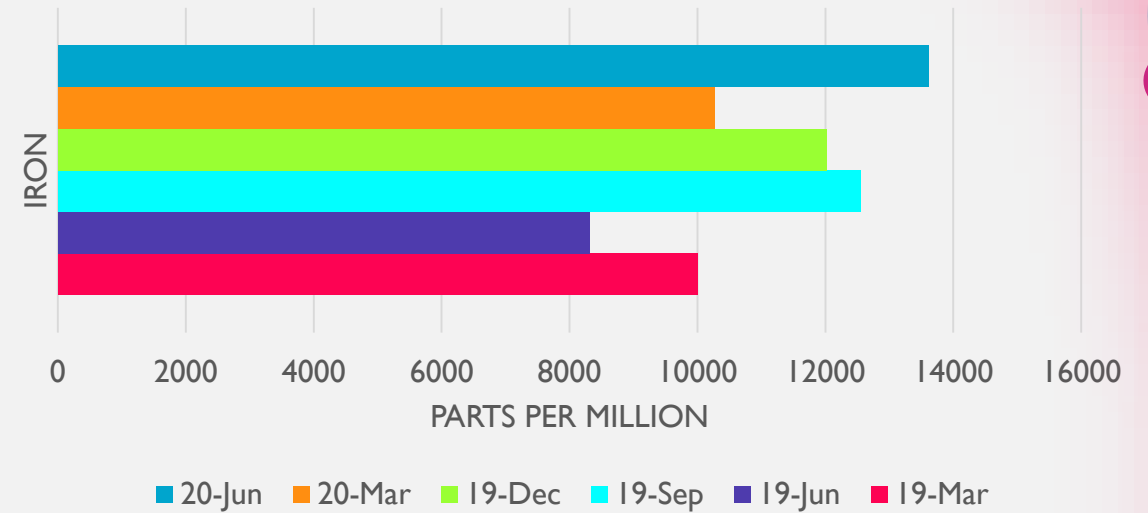


Iron

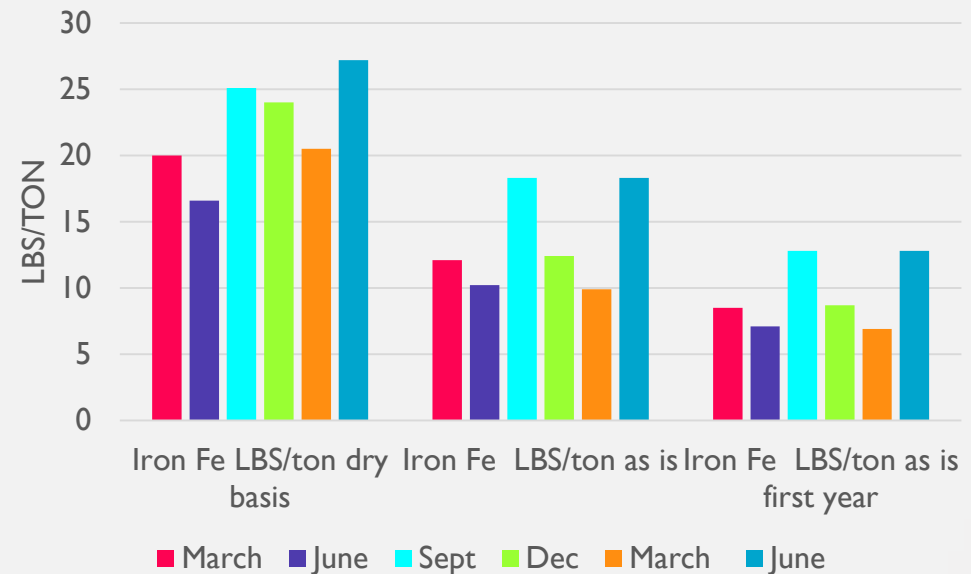
-Micronutrients have various functions and are required only in small amounts. Soil pH and organic content are two important factors affecting their availability in soil....
- The importance of fresh organic residues is due to their ability to chelate the cation trace elements (copper, zinc, iron, manganese)
- Iron helps regulate metabolic reactions, together with specific plant enzymes.
- In addition, iron is necessary for the production of chlorophyll.
- Iron, manganese and zinc are often unavailable in soils of high pH,

-Northeast Farming Association

UCRRA Compost: Iron PPM

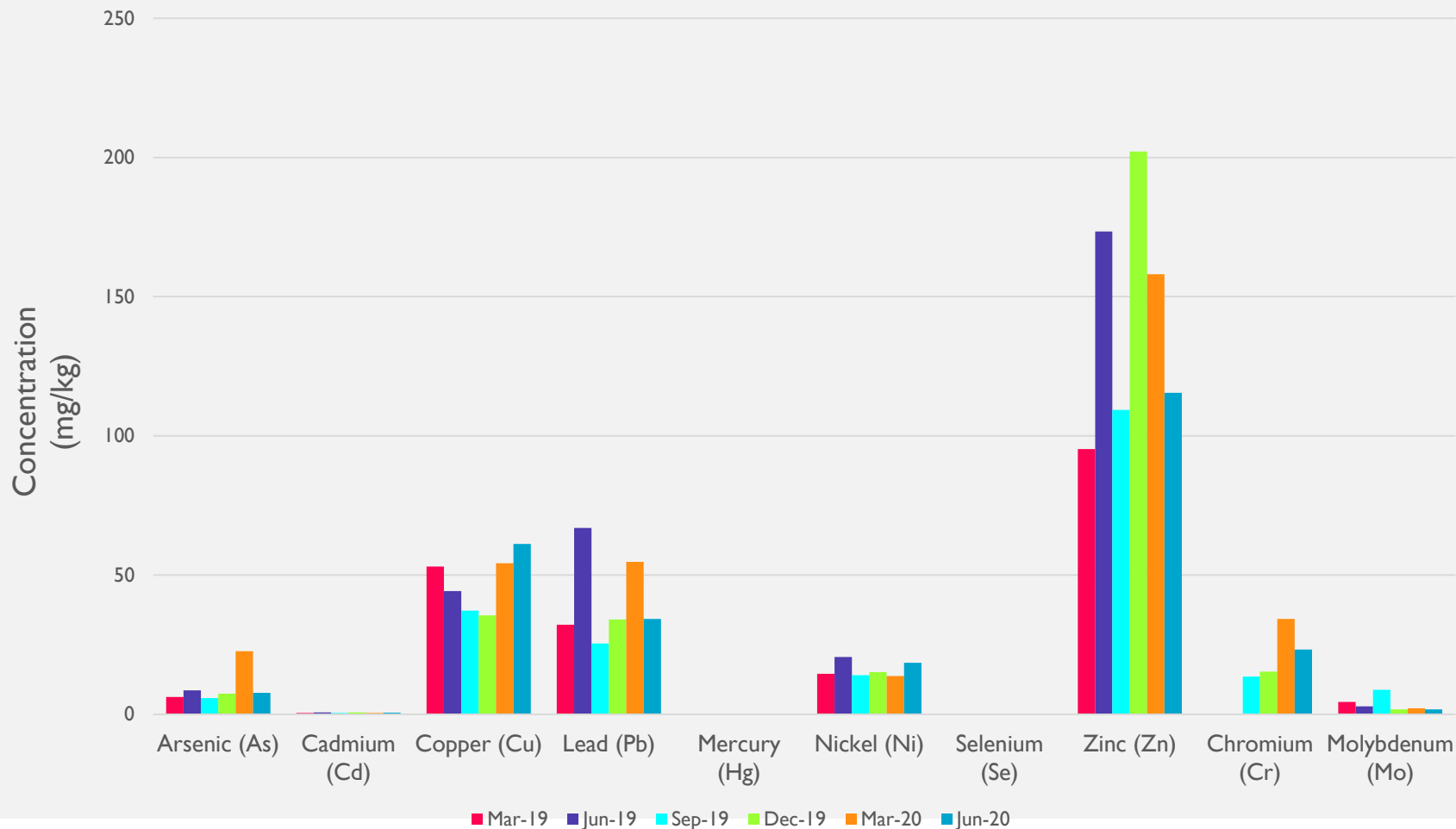


UCRRA Compost: Iron



Heavy Metals (Pb, Ni, Cd, Cr) Micronutrients (Zn, Cu, Fe)

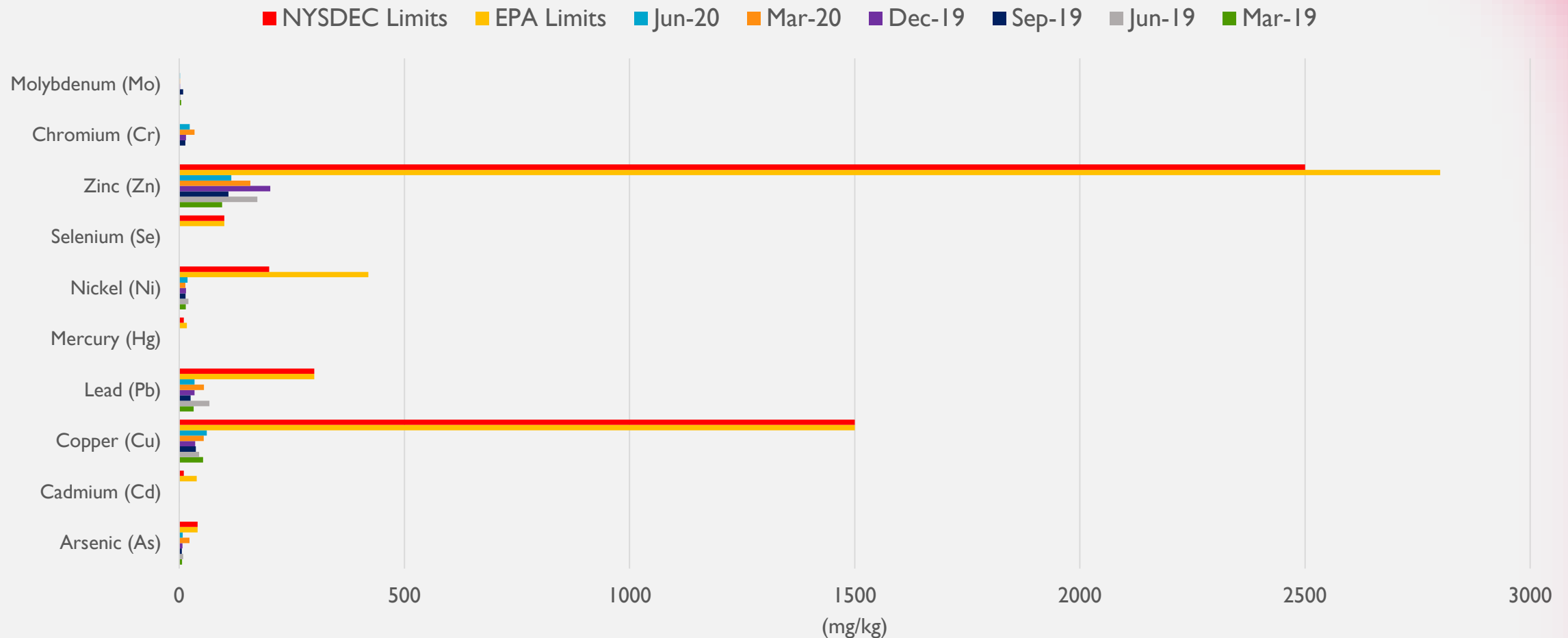
UCRRA Compost: Heavy Metals



Regulations governing the heavy metal content of composts derived from certain feedstocks have been promulgated on both State and Federal levels. Certain heavy metals are known to cause phytotoxic effects in plants in high concentrations and specific plants are known to be more sensitive than others. However, little information is available to interpret the significance of these values. – UMASS Extension Soil & Plant Tissue Testing Laboratory



Comparison of EPA and DEC Heavy Metals Range Limits with UCRRA Compost



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Questions?
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