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Description: Pot trial comparing effects of coral calcium on nutrient and microbial profile in sandy loam soil from Central Willamette Valley, Oregon.

Pot trial evaluated for 14 days in September – October 2008.

Soil was placed in pots and kept at this soil type's "water holding capacity" which was maintained throughout the trial.

Q.: How did you go about holding this soil type at "water holding capacity?"
A: **We determined moisture level of soil as it came in from field. We added water until just before it became too saturated and could no longer hold water. We waited and weighed it again.**
Calculation: Water Absorbed/original weight of soil x 100 = %WHC

Coral calcium product was added to "treated pots" at a rate of 1 kg per acre.

Soil Structure

This sandy soil type has some clay content and does become hard and compacted throughout the growing season. It is tilled often and has lost some soil structure and has small pore size.

Microscopic observations indicated that the control samples on Day 0 (i.e. start of experiment) had less structure and/or very little aggregation of particles. The treated sample had better structure or aggregation of particles. Soil was from field that had not been watered because of unharvested cabbage.

Microscopic observations on Day 7 and Day 14 showed treated samples still with good aggregation. However, control samples showed improvement in aggregation - this is typical of this soil type if soil moisture is maintained. It would be important to set up further trials to demonstrate if coral calcium can maintain good tilth with "drying" and "wetting" of soil throughout growing season.

Microbial Activity

Total microbial populations are higher in treated pots from Day 7 till Day 14 versus control.

Results look promising and interesting for a base pot trial. There is some influence on microbial activity but does decrease a little at 14 days. This just indicates the need for another application or that the product should be used in conjunction with other products to help maintain microbial activity. The total populations are maintained throughout the 14 days and is very good news.

Day 7 shows Active Bacteria and Active Fungi populations increased most significantly in treated over the control. This correlates to increased nutrient availability as well in the Macronutrients in treated pots as well. Control Micronutrients are slightly higher in control pots.

Q.: What causes the total bacteria in the control to increase?
A.: **To keep the experiment fair and to make sure that it is not simply the moisture or liquid that is having an effect, we bring control and treated to WHC and add the same volume of liquid or water to control pots as we are adding with the coral calcium in the treated pots. Simply adding water and keeping soils moist will help with bacteria and fungi levels, both totals and active. Remember totals include both active and dormant, but inactive, microbes.**

Q.: What causes the total fungi in the control to increase?
A.: **See above - moisture or water is big key in crop production and microbial soil health.**

Q.: What is the difference between active and total fungi and active and total bacteria?
A.: **Active means they are "metabolically active". Utilizing nutrients from soil or coral calcium or water for own metabolic purposes. Total populations contain this active fraction as well as the fraction that are dead and "dormant" or "asleep" and not metabolically active but they are very much "alive"!**

Q.: How do you increase your active levels? (We're assuming that active bacteria and fungi are more beneficial to the solubility of nutrients than inactive)
A.: **Add food source - carbon. This can also be provided by the "plant"!!! Add humic acid, kelp and other sources of protein and carbon or sugars.**

Q.: Why is the % active fungi higher for the control then the treated on day 14?
A.: **Typically with no addition of products it does take longer for active fraction in soils to build; that is the reason for adding products like yours!!! The best selling point is that this happens faster! You want this because you want to control when you "turn over nutrients"!!**

Microbial Activity

	Desired Range	Day 0		Day 7		Day 14	
		Control	Treated	Control	Treated	Control	Treated
Dry Weight		0.82	0.81	0.72	0.74	0.86	0.84
Total Bacteria	100-300 µg/gdw	387.11	493.22	647.93	645.12	657.12	677.16
Total Fungi	100-200 µg/gdw	15.69	13.05	34.96	72.35	47.11	87.58
Active Bacteria	10-60 µg/gdw	0.33	0.39	3.02	3.82	3.26	4.12
Active Fungi	2-10 µg/gdw	0.00	0.00	2.33	4.55	8.42	7.68
%Active Bacteria	10-15%	0.00	0.00	0.00	0.01	0.49	0.61
%Active Fungi	10-15%	0.00	0.00	0.07	0.06	0.18	0.09

Nutrients

The rate of coral calcium is not typical of calcium based ag products meant to increase calcium levels in soil. It is observed that while both Control and Treated samples started out with a calcium:magnesium ratio (3:1) that is typical of this field soil; the calcium levels in both remained the same throughout the experiment. But the levels of magnesium at the end of Day 14 is 2x that of control.

This does indicate that coral calcium has a significant benefit not only in adjusting or "opening up" soils or making soils more tilthy by also effecting magnesium levels which offers more control over managing soil structure and nutrient availability as well as microbial activity.

Because this product is called "coral calcium" you would think that the effects would only be on calcium but there are indications of benefits in NPK and magnesium!!

Q.: On day 7 and day 14 is it true that both the control and treated have the same amount of calcium?
A.: **Yes, the small amount of calcium from coral calcium is not significant typically when a farmer wants to add calcium the rate is 1-2 tons per acre**

Q.: On day 7 and day 14 is it true that the amount of K and K_2O have not changed from the beginning of the trail in the control plot?
A.: **Correct. Your product has more of an effect on nitrogen, phosphorus, magnesium, and microbial activity - at least in this soil type....**

Nutrients

	Desired Range	Day 0		Day 7		Day 14	
	Lbs/Acre	Control	Treated	Control	Treated	Control	Treated
Ammonia N	25-68	97.50	66.00	70.00	330.00	8.00	12.00
Nitrate N	11-29	15.00	17.00	35.00	37.00	39.00	38.00
Phosphorus (P)	35-67	178.50	168.00	265.60	432.00	67.52	32.64
Phosphorus (P_2O_5)		410.55	386.40	610.00	993.60	155.30	75.07
Potassium (K)	82-143	350.00	300.00	350.00	300.00	350.00	400.00
Potassium (K_2O)		420.00	360.00	420.00	360.00	420.00	480.00
Calcium		1981.40	1816.32	577.92	577.92	784.32	784.32
Magnesium		693.50	594.43	48.00	19.20	99.00	198.14
	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Chloride		60	40	45	48	40	40
Copper	3-4	50.50	37.50	42.50	17.00	2.65	2.15
Ferric Iron	3-5	57.00	55.00	115.50	73.50	1.40	1.70
Manganese	5-12	95.00	40.50	90.00	55.00	4.00	6.50
Sulfate	31-50	8.25	11.55	11.00	7.00	13.20	8.25
Zinc	1-1.2	0.00	0.00	0.00	0.00	0.10	0.10