

Increasing brassica crop trash breakdown with the application of biostimulant Digester

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Key words

Brassica, crop trash, breakdown, Digester, nutrient availability

Overview

- A block of broccoli was divided into 2, half was sprayed with 4lt/ha of Digester after being cultivated the other half was left untreated.
- Weather conditions over the winter have been extremely wet.
- DHM Lab's soil and soil microbial indicator test were used to measure microbial and nutrient levels



Faster trash breakdown improves nutrient recycling and soil structure.

Results

Soil Microbial Indicator Test results

	Untreated	Digester	% increase
Total microbial count	12,811 kg/ha	10,761 kg/ha	-16%
Bacterial count	5,111 kg/ha	3,111 kg/ha	-39%
Fungal count	2,500 kg/ha	3,750 kg/ha	+50%
Yeast	5,200 kg/ha	3,900 kg/ha	-25%
Anaerobic count	222 kg/ha	111 kg/ha	-50%
Azotobacter	500 kg/ha	333 kg/ha	-33%
Actinomycetes	444 kg/ha	56 kg/ha	-87%
Fungi:Bacteria ratio	1.5:1	2.5:1	
Fungi: Yeast ratio	0.5:1	1:1	

Comments

- Total microbial count is higher in the untreated block. This is driven by the higher bacterial levels. This indicates that the untreated block is still going through the decomposing process. The lower total microbial count and bacterial count for the Digester block indicates the decomposition process has been completed.
- The higher combination of anaerobic and yeast levels in the untreated block also point to a slower rate of decomposition.
- The reduced numbers of Actinomycetes in the Digester block indicates the decomposition process has been completed.
- The Digester block's bacteria:fungi and fungi:yeast ratios are both in the desired range compared to the undesirable range for the untreated block.

Soil test results

	Untreated	Treated	% increase
Cation Exchange Capacity	19.75	24.10	+22%
pH	5.9	5.9	
Organic Matter	6.08%	6.77%	+11%
Base saturation			
Total base saturation	66.92%	72.90%	+9%
Calcium	57.00%	61.71%	+8%
Magnesium	7.24%	8.34%	+15%
Potassium	2.20%	2.44%	+10%
Sodium	0.49%	0.41%	-19%
Hydrogen	33.08%	27.10%	-18%
Major elements			
Sulphur	20.22kg/ha	16.26kg/ha	-20%
Mehlich Phosphate	143.37kg/ha	157.63kg/ha	+10%
Calcium	5012.98kg/ha	6625.33kg/ha	+32%
Magnesium	381.82kg/ha	537.49kg/ha	+40%
Potassium	377.16kg/ha	509.98kg/ha	+35%
Sodium	49.51kg/ha	50.62kg/ha	+2%

Comments

- Digester increased Cation Exchange Capacity. However this increase hasn't diluted nutrient levels in terms of base saturation or altered soil pH. In other words hydrogen hasn't rushed in to occupy the vacant sites on the soil colloid, driving down the pH.
- Digester has increased calcium phosphate, magnesium and potassium levels in the soil.

Conclusion

- The application of Digester has sped up the decomposition of trash and increased soil mineral levels of calcium, phosphate magnesium and phosphate.
- Digester has improved CEC and base saturation without altering soil pH.
- The heavy rain and wet soil conditions has not impacted on the Digester treatment.
- The Digester block is ready for planting while the untreated block is still 2 weeks from completing decomposition