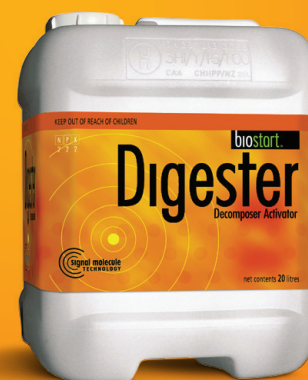


Digester trial boosts maize yield and returns



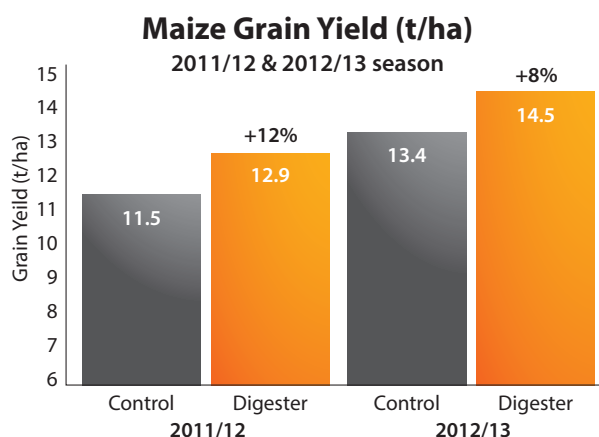
BioStart Digester is a soil microbial activator which speeds up the natural decomposition process. In a two year Bay of Plenty maize trial, Digester increased grain yield by 12% in the first year and 8% in the second year compared to the control. This represents an additional return of \$512/ha in the first year and \$386/ha in the second year, assuming a constant grain price and fertiliser cost.*

Digester Maize Grain Trial

John Magee, Te Puke, 2011-2013

John Magee grows 24 ha of maize on his farm east of Te Puke. John's maize block is cultivated, planted and harvested by Gavin Litchfield of Litchfield Contracting. BioStart Digester was applied at 4L/ha to the trial block via floodjet in mid-winter. The results were then compared to a control block.

"We have had good yield and return increases over the last two seasons with BioStart Digester. Despite the dry conditions in 2013, the crop held up well with good grain fill on the first and second cob. I just want to do the job right, so I will now apply Digester to all my other blocks." - John Magee



Notes: In both seasons the yields were the same or better than national industry standard (2012: 11.5t/ha, 2013: 11.8t/ha). Both the control and Digester block had the same standard fertiliser programme which was adjusted annually based on soil test results.



Increased Return Per Hectare

BioStart Digester increased return by **\$512/ha** in 2012 and **\$386/ha** in 2013 for an investment of **\$76/ha** (Digester product cost)*.

Returns	2011/12		2012/13	
	Control	Digester	Control	Digester
Grain yield (t/ha)	11.5	12.9	13.4	14.5
Yield increase (t/ha)		1.4		1.1
Gross return (\$/ha)	\$4,830	\$5,418	\$5,628	\$6,090
Fertiliser cost (\$/ha)	\$641	\$641	\$566	\$566
Digester cost (\$/ha)		\$76		\$76
Return after fertiliser/Digester cost (\$/ha)	\$4,189	\$4,701	\$5,062	\$5,448
Increased return (\$/ha)		\$512		\$386

*All prices exclude GST. Gross return is based on Magee's 2013 contract maize price of \$420/t x grain yield t/ha for both years. Fertiliser cost is based on Ballance's 2013 price book x actual application rates for both years. Increased return is based on the difference between the control and Digester block (gross return less fertiliser cost and BioStart Digester cost calculated at \$19/L x 4L/ha).

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Soil Analysis

Overall fertility of the Digester block increased versus the control.

Soil Analysis	2011/12			Soil Analysis	2012/13		
	Control	Digester	% +/-		Control	Digester	% +/-
Organic Matter (%)	2.7	3.0	11%	Organic Matter (%)	3.3	3.8	15%
CEC (me/100g)	12.34	13.12	6%	CEC (me/100g)	12.03	13.87	15%
Available N (15cm depth)	70	75	7%	Available N (15cm depth)	75	78	4%
Bray P (mg/ml)	70	75	7%	Bray P (mg/ml)	69	86	25%

Kernel Analysis

Results showed increases in kernel feed components.

Kernel Analysis	2012/13			Kernel Analysis	2012/13		
	Control	Digester	% +/-		Control	Digester	% +/-
Nitrogen (%)	0.81	1.22	51%	Crude Protein (%)	5.1	7.6	49%
Phosphorous (%)	0.28	0.32	14%	Crude Fat (%)	4.3	6.4	48%
Potassium (%)	0.38	0.44	16%	Ash (%)	1.2	1.4	17%
Sulphur (%)	0.09	0.10	11%				
Magnesium (%)	0.10	0.12	20%				

Note: Leaf mineral analysis was also conducted. Digester increased leaf mineral levels of N, P, S, Ca and a number of trace elements.

Interpreting the Results

Increase in CEC (Cation Exchange Capacity)

The soil has a better ability to store positively charged soil nutrients such as K, Ca, Mg and most of the trace elements.

Increase in Bray P

There is an increase in plant available P. Bray P is a measure of plant available phosphorous in acid soils (pH < 7).

Increase in soil Organic Matter %

The soil has a better ability to hold water during drought conditions and indicates more microbes are living in the soil. These soil microbes provide a pool of available nutrients such as N, P, S and B which are not stored on soil colloids.

Increase in available N

The soil has a larger more readily available pool of N for plant growth.

Increase in kernel and leaf mineral levels of N, P, K and S

The plants had a better supply of these nutrients for growth.

Increase in kernel crude protein

Increase in kernel crude protein reflects better N availability.

Increase in kernel ash

There are more minerals in the grains.

How BioStart Digester Works

BioStart Digester is a unique biological decomposition activator. It contains a combination of enzymes, signal molecules, bacteriocins and secondary metabolites from the fermentation of *Pseudomonas putida*, a soil microbe.

When Digester is sprayed onto the soil and lightly incorporated, it activates the naturally occurring soil microbes responsible for decomposition to increase in number. The increased number of beneficial fungi and bacteria then convert crop trash and roots into humus. This creates a fertile seed bed for the following crop. Digester is suitable for all kinds of trash from cereal to maize stubble and helps improve soil structure for minimal tillage.



Typical trash after grain harvest.

Application:

Apply 4 litres per hectare after harvest onto crop trash through standard spray equipment and lightly incorporate. To reduce application costs, Digester can be mixed and co-applied with herbicides like glyphosate.