

PAS110 Biofertiliser



INTRODUCTION TO BIOFERTILISER

PAS110 Biofertiliser is a fertiliser resource produced by an Anaerobic Digestion system. Anaerobic Digestion is the breakdown of biodegradable material through a series of processes in the absence of oxygen. Anaerobic digestion yields methane (CH_4) which is used to power generators to provide electricity into the grid. This process takes place at AD Plants where feedstocks can include food waste and energy crops. At GWE Biogas, based at Sandhill near Kirkburn, only food waste is used in the plant—no energy crops are used to feed the plant.



INTRODUCTION TO PAS110

The British Standards Institution (BSI) approved the Publicly Available Specification (PAS) 110 for “whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials”. Digestate from AD plants has to meet several different criteria to gain PAS110 accreditation. Producers and the public were consulted to set out the standards for the PAS110 criteria, which ensures that no sub-standard digestate can be classed at PAS110. Digestate from an AD plant has to be tested monthly to ensure it meets the PAS110 standards. The digestate has been pasteurised at 70°C for 1 hour which comprehensively sterilises any weed seeds. PAS110 Biofertiliser is a certified product, not a waste, so there are no restrictions by end users, such as millers and maltsters.

Nutrient Content



PAS110 Biofertiliser

NUTRIENT BREAKDOWN

PAS110 Biofertiliser is sold and spread per m³. As PAS110 testing takes place every month, we can calculate an accurate average of what our PAS110 Biofertiliser contains. Although there is a degree of variation in the Biofertiliser from the AD plant, in general it is a very consistent product. The table to the right shows the nutrient values of what each m³ would contain. The levels of N, P and K are well balanced to provide a good all-round fertiliser. Soil testing is encouraged prior to spreading PAS110 Biofertiliser to ensure that growers are aware of their soil indices and the potential beneficial effects to the soil. PAS110 Biofertiliser also contains organic matter which, as any grower knows, is a key constituent of soil health. As with any fertiliser, it is important to incorporate PAS110 Biofertiliser into a Nutrient Management Plan.

Nutrient*	Kg/m ³
Total N	5.304
Available N	4.201
P (Phosphorus)	1.662
K (Potassium)	1.892
Mg (Magnesium)	0.184
S (Sulphur)	0.688
Ca (Calcium)	2.035
Mn (Manganese)	0.013
B (Boron)	0.001
Cu (Copper)	0.005
Zn (Zinc)	0.029

* Taken as an average of regular laboratory tests



MICRONUTRIENTS

Nutrient	Typical Foliar Product (30L/ha)		PAS110 Biofertiliser at (25m ³ /ha)*	Benefit of PAS110 Biofertiliser
	Typical % of Product	kg/ha	kg/ha	kg/ha
S (Sulphur)	8.10%	2.430	17.198	14.768
Mg (Magnesium)	5.30%	1.590	4.596	3.006
Ca (Calcium)	5.20%	1.560	20.875	19.315
Zn (Zinc)	2.00%	0.600	0.726	0.126
Cu (Copper)	1.00%	0.300	0.113	-0.187
Mn (Manganese)	0.30%	0.090	0.328	0.238
B (Boron)	0.30%	0.090	0.021	-0.069
Mb (Molybdenum)	0.02%	0.006	0.009	0.003
Cobalt (Co)	0.01%	0.003	0.003	0.000

The benefits of micronutrients to crops have previously been vastly undervalued by growers, however recently there has been a growing level of interest. Research has been undertaken showing the yield benefits of ensuring that micronutrient levels are maintained through field applications. The introduction of Foliar Products to add to spray tank mixes has added further costs to growers. As shown in the table on the left, many of the micronutrients found in Foliar Products are found in PAS110 Biofertiliser, reducing the need for this extra expenditure for growers.

Spreading



OVERVIEW

At GWE Biogas, we ensure PAS110 Biofertiliser is spread using best practice to reduce ammonia emissions by using Dribble Bar technology. We have invested in the latest GPS spreading technology and can spread from 12-36m, in and out of tramlines, at rates controlled by in-line nutrient analysis on the move. We assess each job beforehand and can tailor spreading equipment to meet the farm and fields needs. The PAS110 Biofertiliser is delivered to the field via HGV and skud tanker, which allows for a near-continuous spreading operation. At times of high demand we use local, reliable contractors that have been thoroughly vetted and we monitor their performance to maintain customer satisfaction. Through these contractors, we are able to offer the option of having the PAS110 Biofertiliser spread via an umbilical system.

SPREADING SYSTEM

Storage

The PAS110 Biofertiliser is continuously pumped out from the Biogas plant and transferred to holding lagoons.



Transport

The PAS110 Biofertiliser is then delivered to the field by HGVs with our specially modified tankers.



Spreading

The PAS110 Biofertiliser will then be pumped into the Samson PGII from the skud tanker, filling its 30m³ tank—ready to spread on the field.

NVZ CLOSED PERIOD

In a Nitrate Vulnerable Zone, PAS110 Biofertiliser cannot be spread between 1st October and the 31st January on most soil types.

36M BOOM SAMSON

We will be able to spread up to 36m from Spring 2019, with a Samson PG II which is able to spread 30m³ with each tanker load. This will improve efficiency and reduce compaction through the need for less passes, whilst having a similar footprint to our current tanker. The SM 8000 operating system will improve the accuracy of application of the PAS110 Biofertiliser.

**NEW FOR
SPRING 2019!**

Applications



PAS110 Biofertiliser

OILSEED RAPE

OSR is a very popular crop to receive applications of PAS110 Biofertiliser. Following harvest of cereals, we usually apply **10-15m³/ha**, which gives the crop the essential nutrients to get a good establishment, as well as moisture. A quick establishment phase is important to OSR crops and can help to minimise damage by pests such as Cabbage Stem Flea Beetle. If the crop gets well established it is more easily able to compensate for leaf loss.

CEREALS

Cereals are the main type of crop that PAS110 Biofertiliser is spread on. The levels of N, P and K required for crop yield can be acquired through split applications, often **20-25m³/ha** for early and mid-season applications then, in the case of milling wheat, a lighter, final dressing of **10m³/ha** is applied.

PAS110 Biofertiliser at 20m³/ha

Nutrient	Chemical Unit	kg/ha	units/acre
Total N	N	106.1	84.9
Available N	NH ₄ -N	84.0	67.2
P (Phosphorus)	P ₂ O ₅	33.3	26.6
K (Potassium)	K ₂ O	37.8	30.3

GRASS

Grass is often dressed with **10-30m³/ha** PAS110 Biofertiliser and it can increase grass yields considerably, especially if applied after the first cut of grass. It has a very noticeable effect—as shown in the picture below. NB statutory no-graze and no-harvest intervals apply.



WITH PAS110
BIOFERTILISER

UNFERTILISED

POTATOES

Potatoes have a high-demand for nutrients so benefit from a heavier application of PAS110 Biofertiliser of **30-40m³/ha** which is then incorporated into the soil shortly after. Potato growers also highly value the application of micronutrients which are contained within PAS110 Biofertiliser, and at higher rates of application, the effect of these micro-nutrients is more significant. Growers find that it also increases the soil moisture holding capacity of the soil.

COVER/CATCH CROPS

Cover and Catch Crops can be established more easily with **10-15m³/ha** of PAS110 Biofertiliser. Encouraging rapid establishment means the land is bare for less time and it gives the cover crop more time to achieve its intended goal, which may be to increase Soil Organic Matter or to scavenge and hold nutrients.

Potential Savings



PAS110 Biofertiliser

THEORETICAL CASE STUDY

- 20m³/ha application of PAS110 Biofertiliser at £3.75/m³
- 20 ha field
- Medium loam
- Winter wheat
- As part of a 200ha/medium sized farming operation

	PAS 110 Biofertiliser	Inorganic Fertiliser
Fertiliser Cost/ha	20m ³ /ha at £3.75/m³ Total = £75/ha	Nitram at £245.00/ton = £59.66 TSP at £320.00/ton = £23.13 MOP at £270.00/ton = £17.03 Total = £99.82/ha
Spreading Cost/ha	N/A—included in price	NAAC Granular Fertiliser Spreading cost = £12.09/ha
Foliar Micronutrients Cost/ha	N/A—within the PAS110 Biofertiliser	Ranging from £1-£5/ha = £2.50/ha
TOTAL COST	£75/ha	£114.41/ha

Applying PAS110 Biofertiliser saves **£39.41/ha** (£788.20 for the field) in this scenario

2019 Prices

£3.75/m³ - Arable(Feb—June) and Grasses
£2/m³ - Arable(Jul—Sep)

Testimonials



PAS110 Biofertiliser

“ We highly rate the PAS110 Biofertiliser as a brilliant starter fertiliser for our OSR. It gives us a quick crop establishment and frees up man-power at our busiest period of the year. We also spread PAS110 Biofertiliser on our grasses to increase our hay yield. The security given by the PAS110 certification is vital as it prevents any issues arising with Farm Assurance. It gives us confidence that it is a clean and consistent fertiliser which is important as we grow vining peas, malting barley, milling wheat and HOLL rape on contract. We appreciate the in-house spreading by Frank, there's no mess and the service is slick and second to none.”

“ We have used PAS110 Biofertiliser for a number of years now. We find that it can benefit a potato crop by increasing the soil's moisture holding capacity, an important factor in a year like 2018. The Biofertiliser also assists in increasing microbial activity in the soil – an important part of our holistic approach to soil health. “

“ We were sceptical about using PAS110 Biofertiliser until we saw the results on our EFA cover crop. The white mustard shot through the growth stages post-application. We are confident the acceleration in growth has ensured our “green manure” will have the intended positive effects on our soil structure and overall soil health.”

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