

Biogas Crops

Over recent years interest has increased in the production of crops for Anaerobic digestion plants.

The advantages are:

- Replacement of fossil fuels
- Reduction of emissions of greenhouse gases
- Reduced impact of slurry
- Less leaching of nitrogen
- Less odour
- Conversion of waste and reducing the need for landfill

Production of Biogas is increased when an energy dense substrate is used to supplement slurry.

To this end crops can be used as an alternative to waste with the added advantage of not requiring a waste disposal licence.

For a farmer developing a biogas plant, high output crops are a necessity. Also, for the grower with a plant in the neighbourhood, biogas cropping represents a useful source of income.

The criteria for suitable crops are:

- High yield of DM per hectare
- High gas potential
- Low costs for growing and handling
- Ease of management and storage

MAIZE SILAGE

Maize is a well-known source of biogas, having the advantages of a high methane yield per acre and being relatively easy to store.

When choosing varieties, high dry matter and high yields are the major considerations; however yields of ME and starch should also be taken into account.

Dry matter at harvest is vitally important. For efficient ensiling the maize needs to achieve a dry matter content of between 30% and 32%. Some of the ultra high yielding varieties grown on the continent for Biogas may not reach this maturity in the UK climate.

RYE

Rye has become very popular in the UK in recent years. We have varieties being tested against hybrid, conventional and forage rye types. We hope to have a comparison table in the 2018 brochure using these trial results.

Comparison of gas yield from different crops

	Maize silage	Beet	Grass silage
Yield, tonnes dry matter/ha	11	13	11,5
% dry matter	33	20	33
% ash in dry matter	3	8	10
Nm3 methane/tonnes organic matter	352	435	307

Comparison of gas yield from different crops. Based on budget estimates from VFL DK. Søren Ugilt Larsen, Agrotech DK 2010 and 2011

BEEET

Beet is the preferred option for 'feeding' anaerobic digesters adapting well to many soil and climate types. It has the highest yield potential amongst all other arable crops and also has the highest dry matter. Due to its higher levels of sugar it has a shorter retention time in the digester than other crops which have a higher lignin and cellulose content. However storage is more difficult than for other crops.

When selecting a variety, yield is of primary importance but cleanliness of the roots should also be considered. Varieties with a smooth root and low dirt tare should be chosen and for this reason Enermax is the perfect choice.

Close cropping of energy beet should be avoided or a build up of rhizomania or beet cyst nematode can occur - the crop should not be grown more often than one in three years on the same ground.

DLF have a dedicated breeding programme for Energy Beets.

GRASS SILAGE

Grass is an extremely versatile crop; it is a good source of material for feeding anaerobic digesters, good for crop rotation, good for the environment and also adapts well to many different soil and climate types. It can be planted in the autumn after a beet or maize crop and be ready for a silage cut in the spring.

High yielding species such as tall fescue and advanced grasses together with red clover have a very high yield potential and they can in many situations compete with maize. Grass and grass plus clover work very well in an anaerobic digester mixed with slurry, thus improving the yield of gas.

Grass is a perennial crop with a good environmental profile, improving crop rotation and bringing long term benefits to soil fertility.

