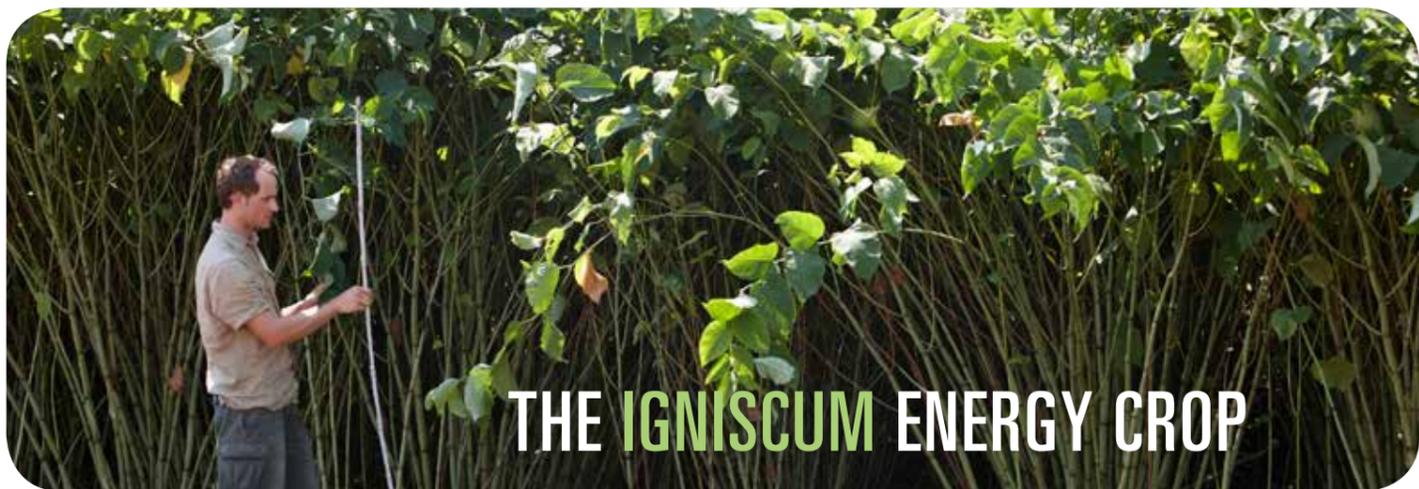




DORSET GM
GREEN MACHINES



THE IGNISCUM ENERGY CROP

Dorset Green Machines is developer and producer of drying equipment, air cleaning systems and control panels.

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Air cleaning, and
sorting systems

**THE
IGNISCUM
ENERGY CROP**

- Permanent crop
- Biogas or biomass
- Maximum gas yield per hectare
- Ecological cultivation
- Suitable for litter



Arguments for a permanent crop

IGNISCUM is a culture from the knotweed family. After being established as a permanent crop on the field (planting and cultivation), it is harvested for more than 20 years. In doing so, the stalks are forced from the root (rhizome) again and again.

There are two primary usage paths for the use of aboveground biomasses from **IGNISCUM**: The harvesting of the dry, dead surface biomasses at the end of the winter provide high-quality heating material for use in incinerators. To this end, the **IGNISCUM Basic**® variety was cultivated. Alternatively, fresh surface bio-

masses can be harvested several times during the summer and can be stored as silage or used as substrate for biogas plants in order to generate electricity. To that effect, the **IGNISCUM Candy**® variety was cultivated.

Nowadays **IGNISCUM Candy**® and **IGNISCUM Basic**® are planted in various regions of Germany. The entire agricultural practice (planting, cultivation and harvest) is carried out using conventional equipment from agricultural operations and vegetable cultivation. Thus the technical aspect of the value chain is established.

Preservation of the soil structure:

The surface soil is only thoroughly farmed once for planting, after which it rests for at least 20 years. Soil structure, water, air regimes and soil organisms (Edaphon) are preserved, maintained and developed. During its lifecycle, no working steps are required for seeding, producing biocides, etc., therefore reducing the demands on the soil. Thus, the area is only driven on half as much compared with maize cultivation.

Accumulation of humus in surface soil:

Humus provides nourishment for soil organisms, increases mineralization and improves water balance and erosion control. The humus content increases over the years due to the shedding of leaves, crop residues and stalk remains. This replenishment of organic matter does not occur as frequently with erosive crops (fruit) such as maize. In

addition, the area is regularly ploughed when cultivating annual crops. This aeration enables the humus to be increasingly decomposed through microorganisms. For permanent crops however, the humus remains stored because the soil is not ploughed.

CO₂-Neutral:

The greenhouse gas carbon dioxide (CO₂) is absorbed by the plants and then used to form biomass. This means that the combustion or release of carbon dioxide due to biogas generation originated from the atmosphere. Compared to the use of fossil fuels, the balance of the CO₂ release is therefore neutral. Next to CO₂, which is bound during the growth of the surface biomasses, the root of the **IGNISCUM** continues to grow. CO₂ is permanently stored here. Accordingly, more greenhouse gases are bound than is the case during the cultivation of annual crops.



Conclusion: As these examples show, the cultivation of **IGNISCUM** has many ecological as well as economical advantages compared to the cultivation of annual crops.

Seed and breeding times:

Despite intensive use, the threat to nests of eggs and young animals is avoided, since the first harvest takes place in the year after this period.

Biotic agents:

There is no known adverse effect on growth due to feeding by young or adult deer. The lack of a fruiting body makes **IGNISCUM** unattractive for boars and thereby reduces the risk of damage caused by game. In addition, there are no pest insects on the list, which could be dangerous to **IGNISCUM**, in particular, no quarantine pests.

Bees:

During the flowering period of **IGNISCUM**, there is no harvest and therefore there is potential for pollinating insects, in particular honey bees, to pollinate late into the season. Hereunto, studies of one bee colony revealed yields of 45 kg of honey in 5 days.

Chemical crop protection:

Once established, the **IGNISCUM** crop does not require any herbicides. The crop spreads quickly in the spring, therefore preventing weeds from pushing through. Viewed over the entire duration, there are 18 times less crop protection products used than in the cultivation of maize! In addition, there are no known pest insects or fungi, which affect **IGNISCUM**. Thus the use of insecticides or fungicides is not required.

Climatic influences:

Permanent crops are significantly more tolerant to short-term extreme

weather conditions. Although they do suffer damage from late frost or periods of drought, they can compensate through e.g. regrowth or stronger root penetration in the soil.

Agricultural machinery:

The harvest times of **IGNISCUM** fresh and dry matter are differentiated from the peak times of corn harvests. Due to the year-round utilization of harvesters, the company offers the possibility of exploiting and financing the expensive machinery much better.

Security of supply:

Through the establishment of a permanent crop such as **IGNISCUM**, a long-term supply of biomass plants is secured. Commercial considerations are no longer subject to fluctuations in the market and the ever increasing prices of substrates.

Risk spreading:

Another important point, which should underlie the consideration of every biomass plant, is the diversification of risk through a substrate mix. Failures in the field can partially be compensated for different crops. Climate change is forcing many crops and species on the most diverse soils to no longer produce high yields and to no longer be as competitive.

Efficiency of the area:

Maximum yields of the area in a balanced cycle of the addition and removal of nutrients will be more important in the future. When cultivating "low-input" crops such as **IGNISCUM**, closed food chains are established fast.