



**Dutch**

Plant Force

# CO<sub>2</sub>

Only when plants are growing, they absorb carbon dioxide from the air.

Because carbon dioxide concentrations in the air are currently rising as a result of man-made emissions, plants can grow larger.

Plants absorb much more CO<sub>2</sub> than previously thought.



# General Information

## ▶ Mammoth grass

This new hybrid is a crossing between *Miscanthus giganteus* x *Tripsacum dactyloides*.

Mammoth Grass is a large perennial grass, growing 6 meters annually.

*Miscanthus* (mammoth grass) belongs to the main type of C4 crops.

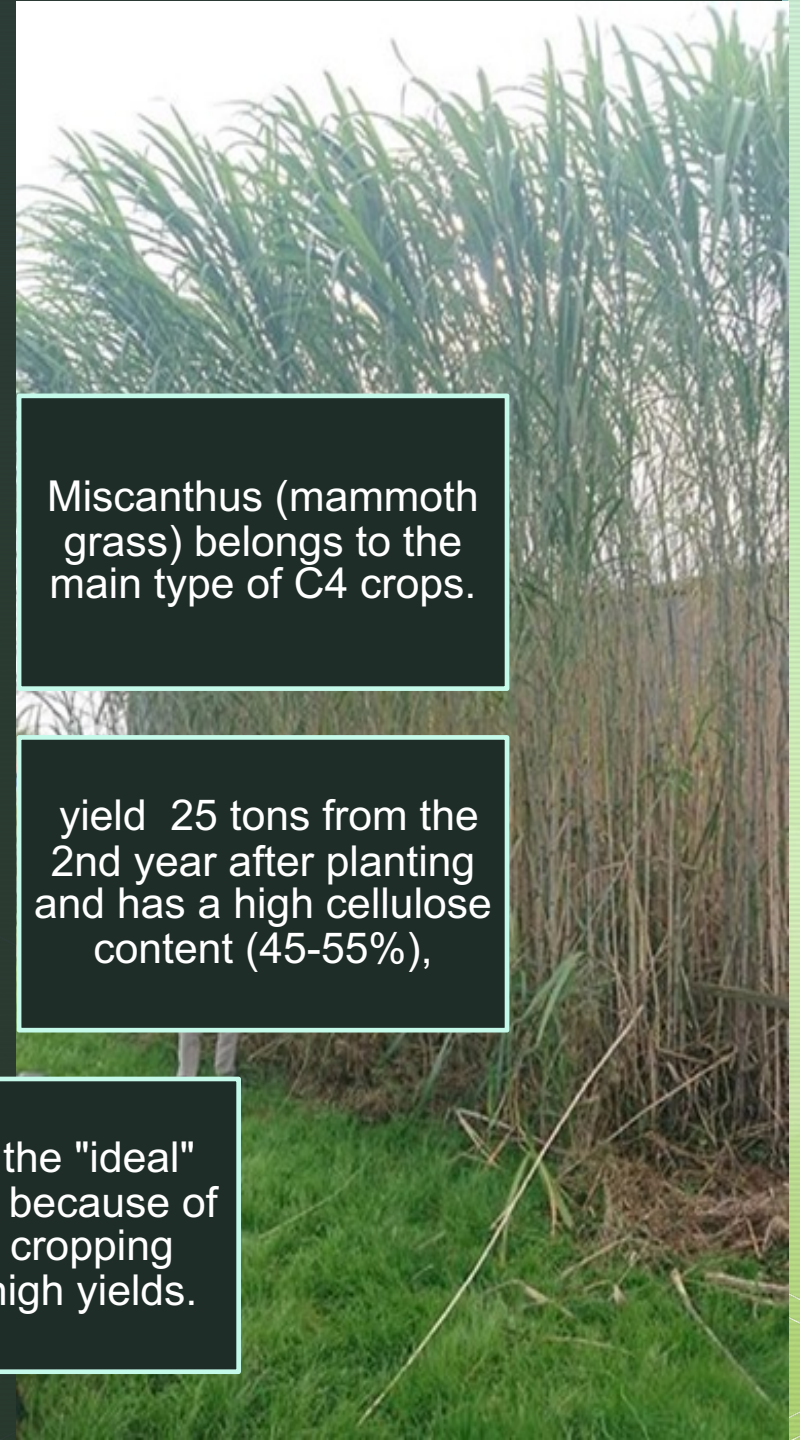
These types of plants are very efficient at capturing carbon dioxide.

The mammoth grass even absorbs 4 times more carbon dioxide as a forest of trees in our climate per hectare.

yield 25 tons from the 2nd year after planting and has a high cellulose content (45-55%),

the mammoth grass is one of the leaders in our climate in the field of reduction of carbon dioxide.

Potentially the "ideal" energy crop because of its annual cropping cycle and high yields.



It takes app.10.000 plants to establish an hectare.

It is a perennial cultivation of 20 years.

This makes a huge difference in tillage and planting costs.

Plants- and plantingcosts can be divided over a life span of 20 years.

There are no pesticides needed, only the first year weed control should be used,

## Benefits of growing



it will overtake weeds once established and weed control to establish simply uses turf type herbicides.

Left standing through the winter the plant dries to 15% moisture level and needs no further drying as corn and wood do, to burn.

The plant requires no fertilizer, this is due to the fact that they simply store up the nutrients that they manufacture (much like a bulb does).

The grass can be stacked and stored in the field for ease of storage. It will not rot and is the best bedding material known as well.

Mammoth grass has a harvest window between fall and spring, harvest at your convenience. It is a perennial crop and will produce indefinitely with very little input. Dividing will help the plant to be vigorous.



# Characteristics

Mammoth Grass is a sterile plant, non invasive, but only grows from root divisions.  
It grows almost everywhere.

It can be grown on marginal land, as it uses its own nutrients that have been manufactured by the plant.

It is a vigorous plant, roughly quadrupling in a years time! Hardy zones 4-9 (Minus 30 Celsius).

20 tons of Mammoth grass harvest = 35 tons of CO<sub>2</sub> per hectare per year.

Mammoth grass absorbs sound so can be used as a noise barrier.



**It is a CO<sub>2</sub> cannibal,**  
**few crops absorb**  
**so much CO<sub>2</sub> at**  
**such a rate.**

With good rainfall this grass reaches an yearly average of 25 tons in Holland of dry biomass per hectare. In warmer countries like Spain this will be even more up to a maximum of app. 50 tons.



Bio-based and circular. Mammoth grass used as a building material provides excellent insulation, is much lighter than traditional concrete, requires no reinforcement, is fire-resistant and fully circular.

This plant likes lots of water to become established, but thereafter is quite drought tolerant. It grows very fast and absorbs particulate matter during growth.



1 hectare of Mammoth Grass can produce the equivalent energy of 125 barrels of crude oil per year.

# Mammoth Grass vs Elephant Grass

Max Height:	<b>6-8 meter</b>	3-4 meter
Max height after:	<b>2 year</b>	3 year
Fiber Color:	<b>white</b>	greenish
Flowering (seed production):	<b>no</b>	yes
Cold tolerant:	<b>yes</b>	yes
Heat tolerant:	<b>yes</b>	yes
Drought tolerant:	<b>yes after 1st year</b>	yes after 2nd year
Herbicide use weed:	<b>first year</b>	first 2 years
Energy content per dry tonne:	<b>18 Gj (estimation)</b>	18Gj
Ton per ha:	<b>22-26 (estimation)</b>	15-18
Energy content per ha:	<b>390-450 (estimation)</b>	250-320
Plant patent:	<b>yes</b>	no



\* All above info is based on Dutch growing conditions, we know warmer climates will increase production (a lot).



# Mammoth grass applications

1. Paper, Waste paper is becoming a scarcity, so there is more demand for paper from the biomass industry

2. Fiber boards and other construction materials  
The low moisture content at harvest and the low specific weight make elephant grass an excellent raw material for lightweight fiber boards.

3. Mammoth grass as stable bedding  
This bedding has a great absorbent capacity, 3x greater than that of straw and double the absorbent capacity of wood shavings. The high absorbency is due to the porous core of the stem. The porous core is able to absorb nitrogen and thereby absorb and neutralize ammonia (smell).

4. Substrate and ground cover  
Mammoth grass is an interesting application as a sustainable and biodegradable ground cover.

5. Energy  
Research has shown that mammoth grass has great potential as a biofuel due to its high dry mass production and low moisture percentage at harvest. Mammoth grass can also be co-fired with existing coal boilers.



The Elephant Grass 2.0  
introducing:  
Mammoth Grass

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