

Mammoth Grass

The Green Evolution



Introduction Mammoth Grass



Mammoth Grass a CO₂ Cannibal

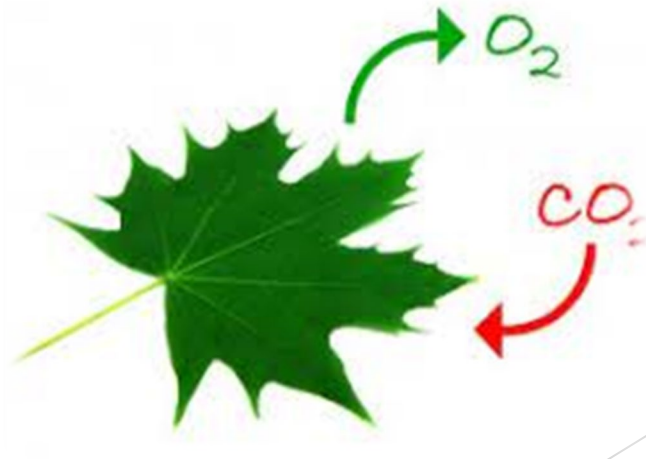
Sustainable agriculture, Mammoth Grass is a high yielding energetic crop, that grows very fast and can be harvested annually.

Mammoth Grass is easily cultivated and not invasive.

Very high carbon (CO₂) capture from the air (app. 60 tons/hectare/year) and also stored in the root system (ground carbon capture, app. 6-8 tons/hectare/year).

Mammoth Grass produces in mild climates app. 30 dry tons fiber per year,

This can be used for several purposes



General information Mammoth Grass

- ▶ Mammoth Grass is a perennial grass and comes back every year for a minimum of 20 years.
- ▶ Mammoth Grass grows annually to 6 meters tall every year.
- ▶ Mammoth Grass produces app. 30 dry tons fiber/hectare every year.
- ▶ Mammoth Grass is an environmental friendly pasture, its large root system captures nutrients and improves water quality.
 - Mammoth Grass is a sterile plant (not invasive).
 - Mammoth Grass is a C4 crop.
 - Mammoth Grass has a high cellulose content (45-55%).
 - Mammoth Grass can also be grown on less tolerant land and does not compete with land for food crops.



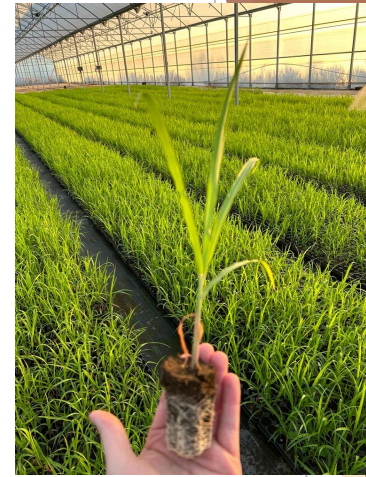
Mammoth Grass and the competition Elephant Grass.

	Mammoth Grass	Miscanthus giganteus
Max Height	5 meters	3,5 meters
Max height after	2 years	3 years
Fiber Color	white	greenish
Cold tolerant	yes	yes
Heat tolerant	yes	yes
Planting time	year round	spring only
Planting form	rooted liners (plugs)	rhizomes
Drought tolerant	yes after 2nd year	yes after 3rd year
Weeding needed	yes first year	yes first two years
Energy Content per dry ton	18Gj	18Gj
Dry ton per hectare	30 tons	15 tons
Energy Content per hectare	540 Gj	270 Gj
Trademarked Brand name	Applied	no
Plant Patent	yes	no
Earning per year (€ 200,- ton)	€ 7,000	€ 3,500



Growing Mammoth Grass

- ▶ Mammoth Grass is mainly produced by stem-cuttings and by tissue culture, the rooted cuttings can be planted year round.
- ▶ There is app. 10.000 plants needed per hectare.
- ▶ The first year we advise to fertilize the field and if needed moderate irrigation is needed.
- ▶ The first year weed control is needed this can be done biological or with herbicides.
- ▶ The first year the Mammoth Grass will reach app. 3,5 meters.
- ▶ Mammoth Grass is high temperature resistant and can handle temperatures till minus 25 Degrees Celcius.
- ▶ Mammoth Grass is very resistant to pests and diseases.
- In late Autumn the senescence season starts, parts of the nutrients provided by the crop debris from the growing year migrate to the underground rhizomes to replenish their reserves



Harvesting Mammoth Grass

- ▶ The dry fiber from the Mammoth Grass can be harvested, when the plant dries to 15% moisture level (this is around March) and needs no further drying as corn and wood do to burn.
- ▶ The farmer can use his own machinery for cutting the dry stems.
- ▶ The Mammoth Grass fiber can be shred to different size caliber, depending on the final utility that the final supplier is going to give it.
- ▶ The first year production of the dry fiber is still low, we advise the first year to shred the stems and leave those on the field, this is a great fertilizer and will improve the structure of the soil.
 - Second year production will be app. 16 tons.
 - Third year and beyond production will be app. 30 tons.



Mammoth Grass, easy and sustainable

- ▶ 1 time investment in planting material for the next 20 years.
- ▶ Only first year work/cost for planting, feeding, irrigation, weed control and harvest.
- ▶ From the second year only harvest cost apply.
- ▶ We think the dry ton price will continue to rise because more industries are looking for applications to use this C4 Mammoth Grass, Governments are pushing to expend rapidly in bio-based fuels, bio-based building etc.
- ▶ Carbon Credits can be applied for in ground storage CO₂ and also for the CO₂ in the dry fibers, if those are stored for a long time, like concrete blocks etc.
- ▶ Mammoth Grass can be a true sustainable and circular crop.



Mammoth Grass during the season and the final dry fiber



Mammoth Grass and possible applications

- ▶ Biomass.
- ▶ Biofuel.
- ▶ Additive for biodegradable polymers.
- ▶ Raw material for paper, cardboard and geotextiles.
- ▶ Building materials like insulation, cement additive, board material, etc.
- ▶ Bedding for Animals. it has a great absorbent capacity, 3x greater than straw and double the absorbent capacity of wood shavings. The porous core is able to absorb nitrogen and thereby absorb and neutralize ammonia (smell).
- ▶ Ingredient for feed.
- ▶ Growing substrate for greenhouses and pot plant growers.
- ▶ Etc.



Mammoth Grass Circular/Sustainable



Fiber of Mammoth Grass



Bedding Material in stable



Mushroom substrate



Pyrolyse of mushroom compost



Electricity



Bio-char



Mammoth Grass and Carbon Credits

In addition to all the benefits already mentioned, such as twice the yield compared with Elephant grass, Mammoth grass offers significant benefits in terms of carbon credits. Each hectare of Mammoth grass stores large amounts of CO₂, both in the stems as well as in the roots.

Remarkably, about 50% of this CO₂ storage occurs in the roots, which remain in the soil for 20 to 30 years, thus continuously retaining CO₂ retention. The remaining 50% is in the above-ground parts of the plant.

The value of carbon credits depends on the application of the harvested fiber. If the fiber is used for sustainable purposes, such as isolate the CO₂ in concrete, this yields more credits than if the grass is converted into biofuel.

Although the latter is still more sustainable than extracting oil, it does not qualify for eligible for a significant amount of CO₂ credits.

Because of the complexity of certifying aboveground CO₂ storage, we focus first on the sequestration and certification of CO₂ in the ground.

Farmers working with us can claim these carbon credits, which are a new source of income.

These credits are tradable and offer not only advantages (income) for the farmer but also for potential investors.

Dutch Plant Force works with Dutch Green to market these carbon credits world wide.



Mammoth Grass, What not to like?

- Very profitable crop for the farmers
- Low maintenance crop for the farmers
- Circular
- Sustainable
- Evolutionary Product
- Environmentally Friendly
- Green product of Nature
- Strong and Green
- Name recognition
- Markt protection possible

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Mammoth Grass and Triodos Bank

Van stoppende melkveehouder naar toekomstbestendige Mammoetgrasteler

1. De uitdaging: een duurzame transitie die vastloopt op voorfinanciering

Nederland staat voor een grote landbouwtransitie. Veel melkveehouders stoppen - vaak noodgedwongen - door stikstofbeleid, schaalvergroting en dalende marges. Deze ondernemers beschikken over grond, kennis en ondernemerschap, maar missen vaak **liquiditeit** om een nieuw, duurzaam verdienmodel op te bouwen.

Een concreet knelpunt:

Mammoetgras is een bewezen en duurzame teelt

Maar: **eerste opbrengst pas na ± 3 jaar**






Plantmateriaal en aanplantkosten moeten direct worden betaald

De stoppende melkveehouder kan die 3 jaar niet voorfinancieren

Hier ligt precies het moment waar een impact gedreven financier als Triodos Bank het verschil kan maken.

2. De oplossing: Mammoetgras als stabiele, duurzame langetermijnteelt

Mammoetgras is bij uitstek geschikt voor gronden van stoppende melkveehouders:

-  **CO₂-negatief:** langdurige koolstofvastlegging in bodem en biomassa
-  **Weinig input:** geen kunstmest, nauwelijks gewasbescherming
-  **Biodiversiteit:** rustgewas met positieve ecologische impact
-  **Veelzijdige afzet:** bio-energie, biobased bouwmaterialen, vezeltoepassingen
-  **Langjarige opbrengst:** minimaal 15-20 jaar productie na aanplant

Na de opstartfase ontstaat een **stabiele kasstroom** met lage kosten en beperkte risico's.



Mammoth Grass and Triodos Bank

3. Waarom Triodos Bank hier een sleutelrol heeft

Dit project raakt precies de kern van de Triodos-missie:

🌍 **Positieve impact**

Versnelt de landbouwtransitie

Verlaagt CO₂-uitstoot en verbetert bodemkwaliteit

Maakt biobased ketens mogelijk (bouw, energie, materialen)

👤 **Sociale rechtvaardigheid**

Biedt stoppende melkveehouders een **waardig en toekomstgericht alternatief**

Voorkomt leegloop van het platteland

Houdt landbouwgrond in duurzame productie

🏠 **Financieel gezond**

Voorspelbare opbrengsten na jaar 3

Lage operationele kosten

Langjarige contracten met afnemers

Grond blijft waardevolle onderliggende asset

4. Voorstel: een Triodos-financierings- of investeringsmodel

Triodos kan dit mogelijk maken via:

Optie 1 - Transitiefonds Mammoetgras

Voorfinanciering van plantmateriaal en aanplant (jaar 0-2)

Aflossing start vanaf eerste oogst

Lagere of geen rente in de eerste jaren, oplopend na productie

Optie 2 - Impact-investeringsfonds

Triodos participeert (tijdelijk) in de teelt

Melkveehouder koopt zich na 3-5 jaar terug

Gedeeld risico, gedeelde impact



Mammoth Grass and Triodos Bank

5. Waarom nú instappen

Grote groep stoppende melkveehouders zoekt alternatief

Vraag naar biobased grondstoffen groeit snel

Mammoetgras is bewezen, maar opschaling stukt door financiering

Relatief kleine investeringen creëren grote systeemimpact

👉 Met een gerichte oplossing voor die eerste 3 jaar maakt Triodos het verschil tussen **stilstand** en **structurele verduurzaming**.

6. Samenvattend

Triodos Bank investeert hier niet alleen in een gewas, maar in:

een rechtvaardige landbouwtransitie

herstel van natuur en bodem

toekomstperspectief voor boeren

stabiele, duurzame waardecreatie

Mammoetgras kan alleen groeien als de financiering meegroeit.

Triodos kan die katalysator zijn

