

Wesseling, 21. Mai 2014

New developments and results on green decortication of hemp stalks



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MOTIVATION:

- high quality hemp fibers for textile use
 - elimination of weather impacts on harvest and fiber quality
 - combined harvest system which enables farmers to sell a valuable product to the industry
 - making farmers independent of the necessity of having a hemp mill near
 - a fiber product that can be processed/refined in a continuous process with low energy and chemical input
- ...

Getting started – and special thanks

- Dr. Jörg Muessig: bringing us together sharing a ride to Bologna to the HempSys project in 2006
- Dr. Marianne Leupin: inviting us to Switzerland to learn about her project for green decortication in 2008
- Ina Sigmund (stfi): being always there for us and bringing point of views together

The new process: Decortication of freshly cut hemp stalks with a „bast-selector“



The process steps

- feeding parallel aligned, freshly cut hemp stalks into the selector
- decortication of the raw material with reproducible impact-minimized process conditions
- selective eduction of the plant components:
 - „selected bast stripes“ as well as
 - „hurds suitable for pouring“

Conclusion

1. very low construction costs through simple process design
2. a minimized energy input free of pressing forces on the fresh stalks leads to a dramatic reduction of typical fiber damage
3. 100% separation of bast and hurds in 1 step
4. no dust exposure

Sneak view of process speeds:



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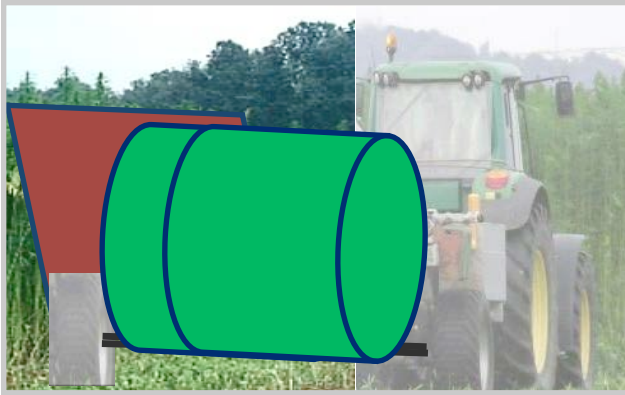
Sneak view on the 2nd machine constructed for higher volume:



Aerodynamics are the key!



Final target: selection of raw materials through combined harvester on the field



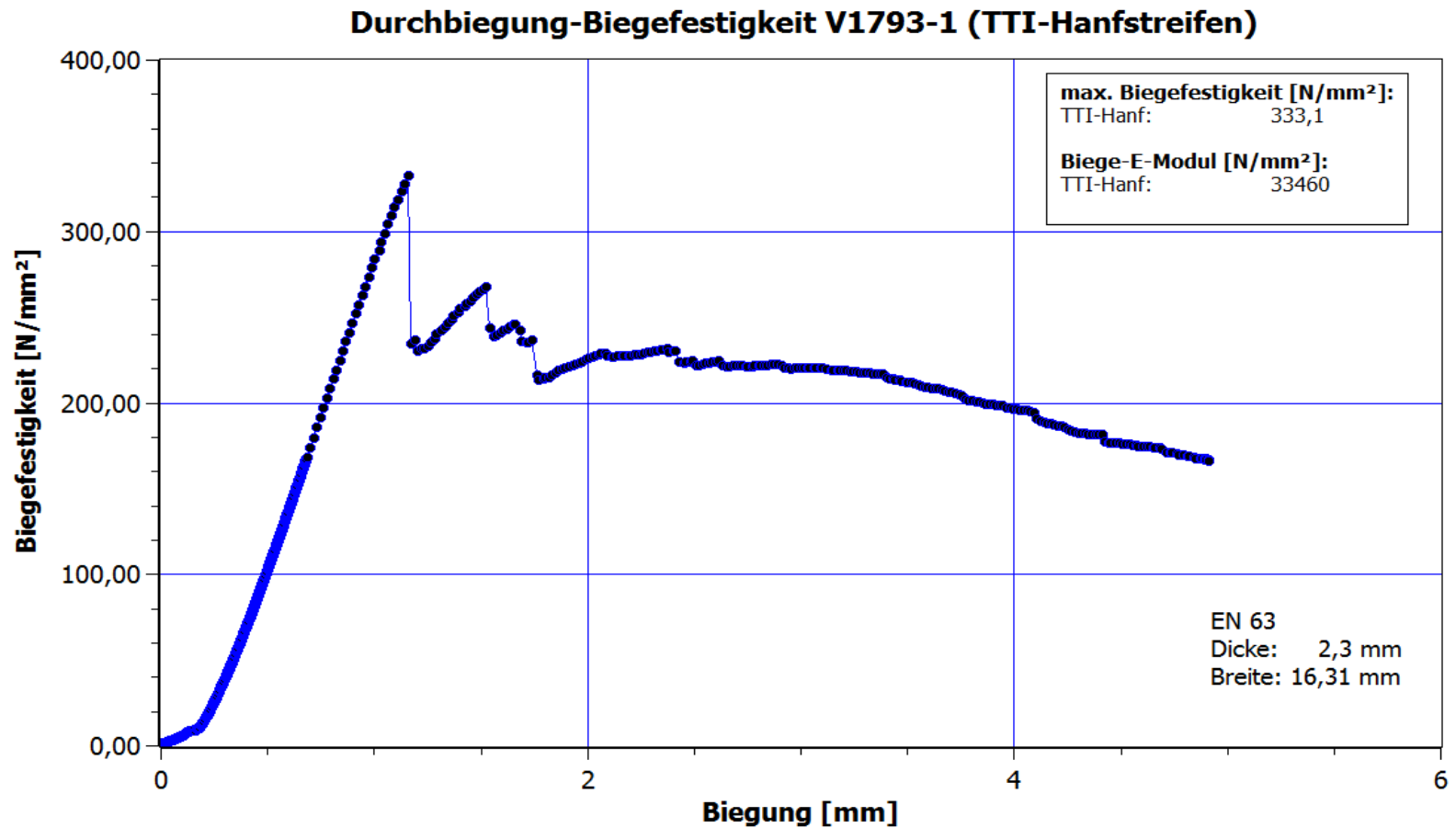
Process steps:

1. Mowing while cutting the flower part
2. Collection of stalks and cleaning of leafes
3. Feeding the stalks parallel into the selector

Results:

1. Harvest at the time of best fiber properties is possible at any wheather conditions
2. Stalks are free of contamination as they never touch the ground
3. The wheather conditions do not have any impact on the fiber properties
4. Complete selection of raw materials after one field turn

The real surprise: strength properties of test strips with „PTP“ measured by „B.A.M.“



Making it public: the keys of low impact green decortication

1. feeding the stalks while holding them without squeezing
2. high speed „breaker“ with no sharp edges
3. a aerodynamic stable environment which „sucks“ the bast towards the „breaker“ in the processing part of the machine
4. free vector for hurds at high speeds
5. sucking device that takes over the bast stripes at the same speed as feeding

Switching to a new approach:

Due to different reasons Bast&Faser decided to concentrate its limited resources on a new approach that is able of selecting stalks no matter if fresh, stored, dried or retted with a zero impact technology capable of working 24/7 all year round.

While we are putting all our efforts into the new approach we invite interested companies to go ahead in developing this process further into a full combined harvester.

The combined fresh harvest and green decortication is regardless of its challenges in handling the gluey bast a valuable option for hemp farming located far from stationary processing facilities.

We also invite possible investors and research partners from specific fields to help finalize our new approach for the „future hemp factory“ producing max. strength fibers at lowest cost plus introducing a new hurd product family.



Thank you for your kind attention!



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