

Interreg



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Workshop o oběhovém hospodářství a skládkování Žitava-Liberec 2024

Kreislaufwirtschafts- und Deponieworkshop Zittau-Liberec 2024





Fertigung biobasierter Einwegprodukte auf der Basis von agrarischen Reststoffen

Manufacturing of bio-based disposable products made from

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Matthias Kinne, Jens Weber**

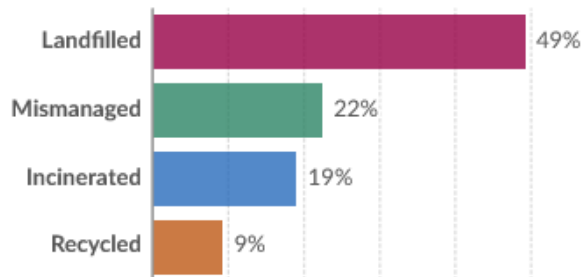
29.10.2024



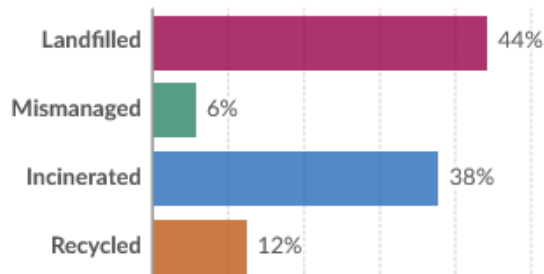
- Motivation: Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment



World



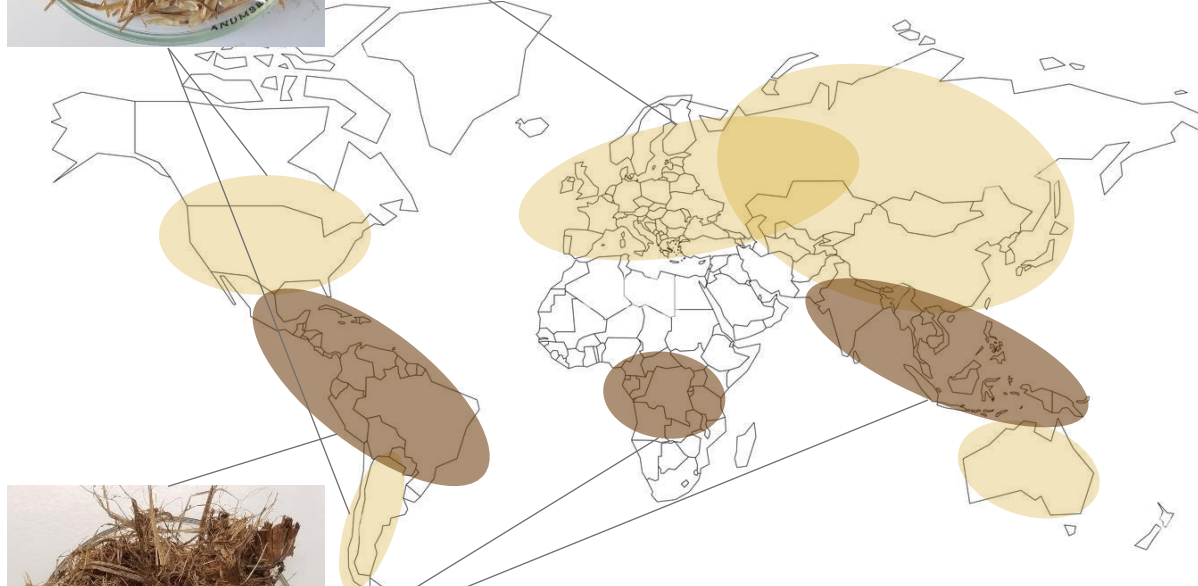
Europe



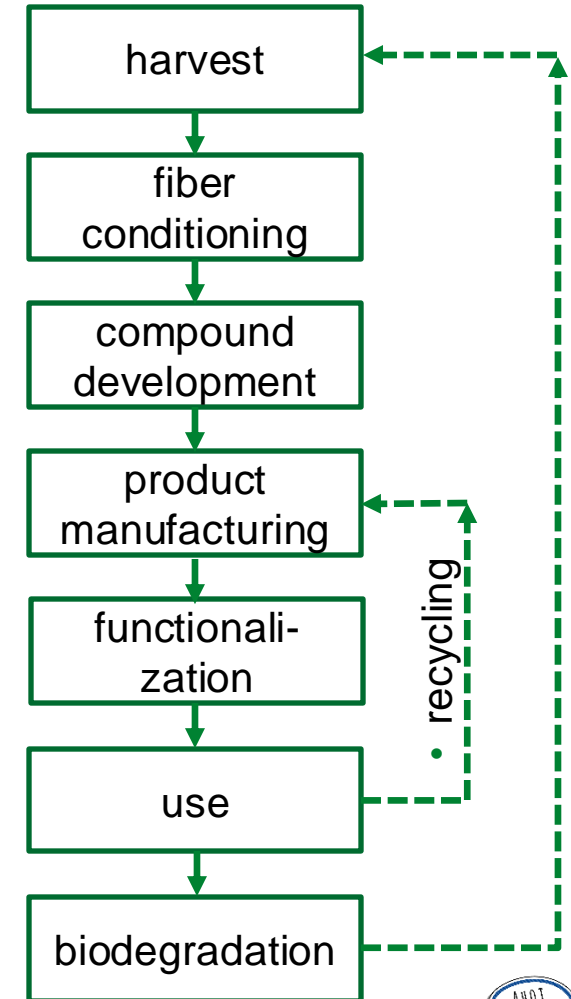
Goal: development of technology for the fabrication of bio-based single-use products



- wheat straw and chaff
- 200 mio. hectares



- banana fibers (pseudostem)
- 5 – 6 mio. hectares

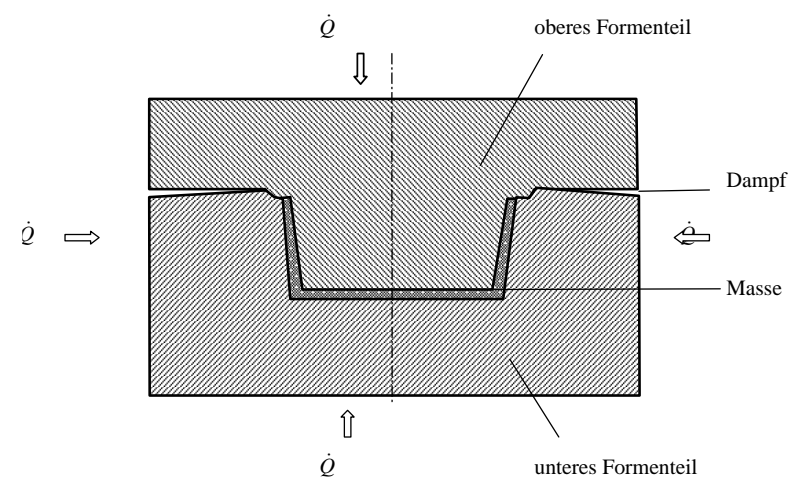
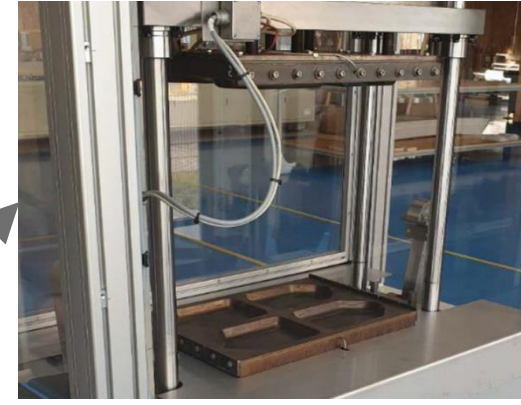


- fiber conditioning (dehydration + crushing)



mixture development (+ binder and water)

- product manufacturing (via hot pressing process)



- possible products:



- packaging inlay



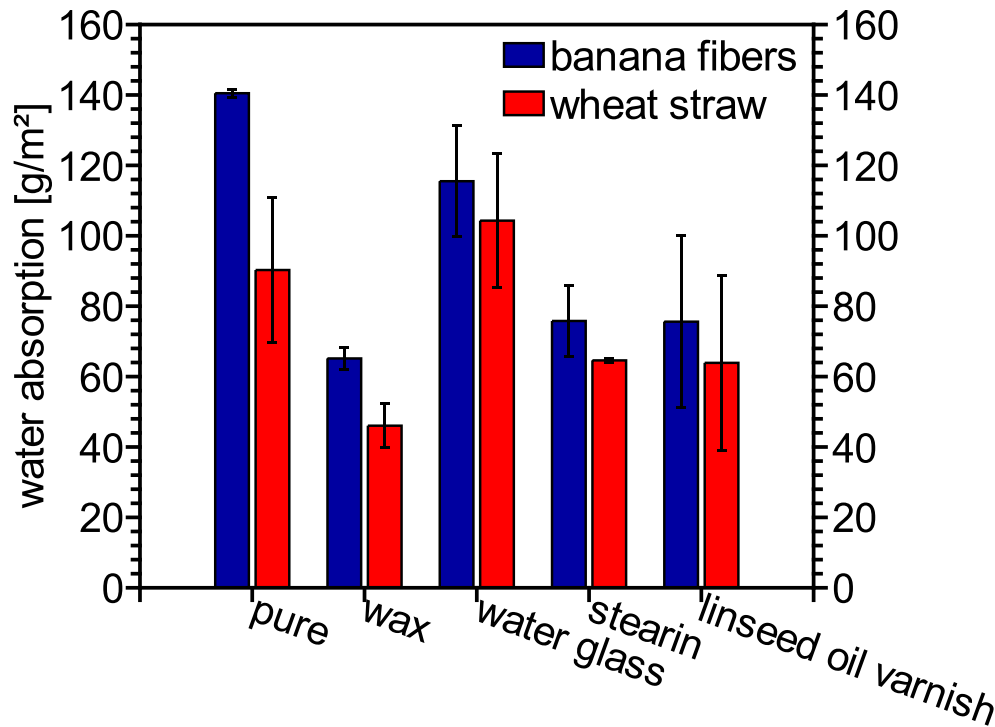
- serving dish



- part of

- several bio-based binders applicable (starch, pectin, agar, alginate, carboxymethylcellulose)
- diverse products manufactured, depending on tool form
- even complex geometries
- critical factors:
 - type of fiber and ratio to binder
 - water outlet

- surface modification, increase resistance to certain liquids



material	water [min]		oil [min]	
	before	after	before	after
banana fibers	20	70	40	105
wheat straw and chaff	3600	-	3600	-



- end-of-life solution:

- **A) recycling**

wheat straw and chaff



banana fibers



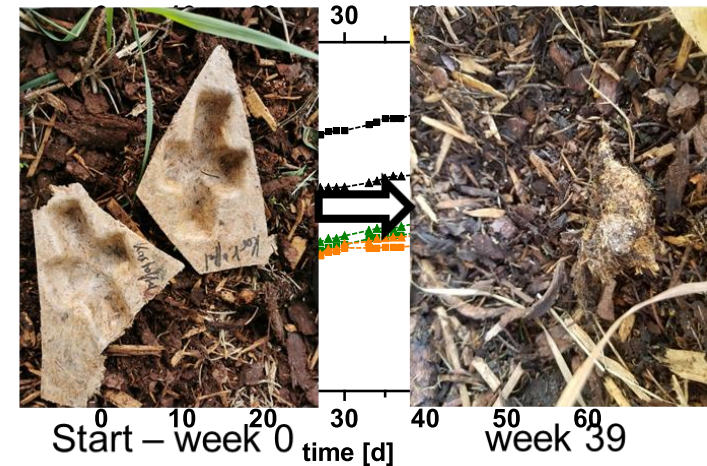
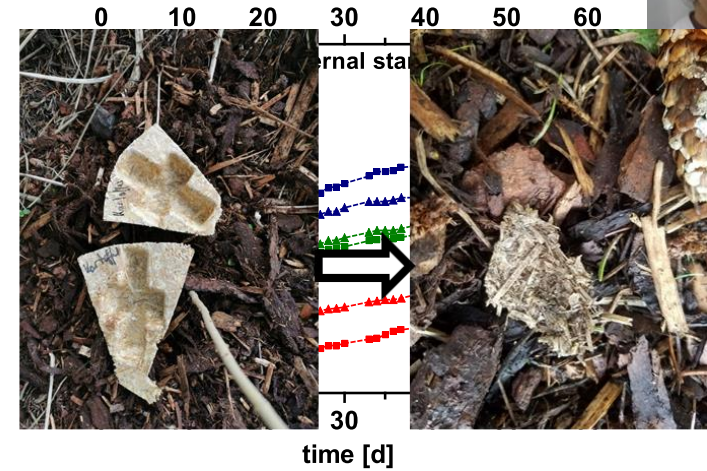
fragmentation and
 reprocessing (2 cycles)



wheat
 straw
 and
 chaff

banana
 fibers

- **B) biodegradation**



Summary

- development of fully bio-based single-use products through:
 - fiber conditioning
 - mixture development
 - compound manufacturing
 - (surface modification)
- variety in geometry and plant materials used
- proof of recycling and biodegradation
- scalability



Thank you for your kind attention



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GEFÖRDERT VOM



Bundesministerium
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