

Research on residual materials at the IfBB

Extensive researching of residual materials for biocomposites is a core competence of the IfBB.

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*Fakultät II
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In action for biocomposites: Residual materials

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More about IfBB's research projects:
www.ifbb-hannover.de/en/research-projects.html



Source: IfBB

Residues such as spelled husks, corn spindles, agran nuts-hells, straw, paper or miscanthus offer great potential as a raw material source for biocomposites.



Residual materials

When using renewable raw materials, large quantities of residues regularly accumulate in many production areas, for example in agriculture, animal feed industry, industrial food and beverage production or waste recycling. They arise during the production, further processing or after the use of various products.

Residues can be, for example:

- ▶ Eggshells, fruit pits or vegetable and nutshells, coffee grounds
- ▶ Cereal and rapeseed straw, hemp or flax dust or harvest residues in potato and sugar beet

Although they are currently partly in use in agriculture and the animal feed industry, in many cases they are also burned or remain unused. In many production areas, alternative ways of use are urgently required.



Source: abc advanced biomass concepts GmbH

When processing coffee beans, large amounts of coffee grounds are produced which can be used as fillers in biocomposite materials.

Areas of application

The potential for using residual materials in the plastics industry is great. They can be processed by extrusion and injection molding and used for various purposes:

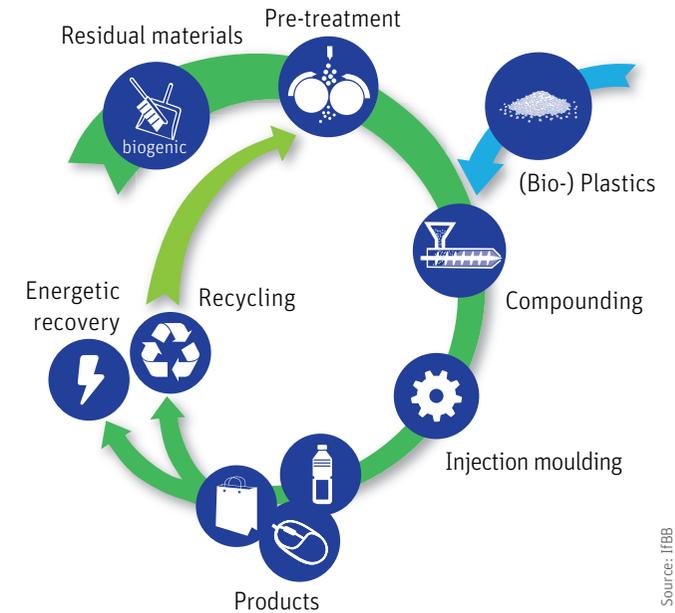
- ▶ **Raw material source for bio-based plastics:**
Carbohydrate-containing residues are used for the fermentation of precursors for the polymerization of thermoplastics.
- ▶ **Reinforcements:**
For example, bio-based fibers such as grain and rapeseed straw can be used to reinforce the material.
- ▶ **Fillers:**
For example, ground nuts shells and stones in fruits or also powdered substances such as coffee grounds can serve as fillers.
- ▶ **Dyes:**
Powdered substances such as coffee grounds can also be used as dyes.
- ▶ **Functionalizing additives:**
Plant residues can improve the properties of a biocomposite as functionalizing additives.



Source: IFBB

Advantages

- ▶ Residuals as raw materials instead of crude oil
- ▶ Profitable utilization of previously unused residues
- ▶ Cascade use: The residues are initially used several times before they are used for energy recovery.
- ▶ Increasing the land use license in the area of renewable raw materials
- ▶ Lower use of primary substances
- ▶ Reduction of CO₂ pollution
- ▶ Development of new outlets for residual materials
- ▶ Development of biocomposites of up to 100 % from renewable raw materials
- ▶ Reduction of the total costs of biocomposites



Source: IFBB

Processing a residual material for use in a biocomposite from pre-treatment to recycling