Corn Stover Agglomerates for Oil Absorption

Conventional technology, such as compression pelleting, uses high compression dies where material is forced under friction through a die cavity.

Description of the Invention

A lightweight, biodegradable oil absorbent material created from corn stover shows desirable oil sorbency characteristics, making it an effective alternative to clay-based sorbents. Dust-free corn stover agglomerates are produced by a gentle agglomeration and rolling action using a novel, two part bonding system that forms a web onto which additional particles adhere and roll upon. The web is formed as a result of crosslinking liquid and solid portions of binding system, and the cellular structure of the corn stover is conserved: particles remain intact in an undensified, "non-collapsed" state, allowing oil and other hydrocarbon fluids to wick into its porous structure. The ground corn stover is gently agglomerated into 4 to 8 mm beads with a very high open porosity, creating pore surfaces and pore volume for oil and other liquids to be captured. Overall, this new process creates agglomerate sooner, at lower moisture and with superior green strength compared to single stage binders. Compared to conventional clay based absorbents, agglomerated corn stover fiber has over 5 times more sorbency, significantly less ash, and provides more recoverable energy.

Features and Benefits

- Lightweight, biodegradable oil absorbent material from corn stover
- Alternative to clay-based sorbents
- Agglomerated corn stover fiber has over 5 times more sorbency, significantly less ash, and provides more recoverable energy than conventional clay based absorbents
- Process creates agglomerate sooner, at lower moisture and with superior green strength compared to single stage binders
- Gentle agglomeration and rolling action using two part bonding system
- Conserves cellular structure: particles remain intact in an undensified, "non-collapsed" state, allowing oil and other hydrocarbon fluids to wick into its porous structure
- Very high open porosity
- Simple process uses commonly available agricultural equipment

Potential Applications

- Oil Absorbent
- Alternative to clay-based sorbents
- Animal and pet bedding
- Renewable materials
- Engineered carrier for biological fertilizers