Corn Stover Fractions from Different Harvest Conditions

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Introduction

There is a lot of variability in biomass. This variability can make it difficult to process the biomass into a consistent format for handling and conversion. As a result, bioenergy feedstocks are often under- or over-converted. Corn stover in particular can be harvested in different ways, baled in different ways, and has significant intrinsic variability due to its very different anatomies. These factors could cause variability in the fractions of corn stover. The fractions of corn stover are leaf, husk, cob, and stalk.

Bale Fractions

<table>
<thead>
<tr>
<th>Field</th>
<th>Harvest Method</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kadolph</td>
<td>Raked</td>
<td>2018/2019</td>
</tr>
<tr>
<td>70/71</td>
<td>High-Cut</td>
<td>2020</td>
</tr>
</tbody>
</table>

First, we look at the fractions of each bale. We are looking at material from two different fields, three different harvest methods, and from two different years. Each bale is labeled to the left with the percentage of each fraction in the bale. Each bale seems to have a variation of each fraction.

Future Work

- Test the feed rate of whole material with a moisture content of 10%, 20%, and 30%.
- Further studies of feed rates for the corn stover fractions.
- Further studies will include density and flowability measurements of ground material at INL, organic composition at INL, and convertibility at SUNY.
- Air classification (commericially relevant) will be used to generate fractions rich in the various anatomies (>80% wt), and the studies will be repeated.
- Determine if mechanical preprocessing is worthwhile.

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