Final project – Straw data

**Goal**:

Investigate the following, and explain what and why you see what you do:

* Is there a difference between the locations?
* Is there a year effect?
* Can you predict xylose and glucose release?
* Is the xylose and glucose release correlated? If yes, is this a problem?
* Can a model on one year/ set of locations explain the remaining samples?

**Filename**: straw.ltx

**Number of samples**: 1124

**X** (1124x1050): 1124 samples measured by NIR in the range 400-2498nm (400-1098 nm is the VIS range, and 1100-2498 nm is the NIR range)

**Pure** (3x1050): Spectra of pure samples (ligning, cellulose and xylose)

**Yref** (1124x2): Glucose and xylose release (measured by an enzymatic degradation)

**ID (1124x2)** Location – 9 different (see below)

Year – 2006, 2007 and 2008

Location:

1. Abed
2. Fyn
3. Holstebro
4. Hornsherred
5. Rothamsted
6. Sejet
7. Søtoften
8. Tystofte
9. Taastrup

**Description:**

In the energy sector, it is of interest to know the energy potential of the raw material that is bought by the producer. Currently, the state-of-the-art method for determining the sugar potential of straw is by the use of an enzymatic kit, requiring several analytical steps in order to achieve a reference value. It is therefore of interest to investigate whether it is possible to get a faster estimate of the potential through the use of NIR.

This is a dataset collected across several years, and through several locations. It is actually a gathering of experiments done for different purposes, but here all the samples have been measured for the same two constituents of interest: glucose and xylose release.

These data have kindly been made available by Jane Lindedam.

Table 1: Complete overview of all the samples.

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Location | Comment | # |
| 2006 | Abed Sejet | 106 modern northern European varieties | 208 |
| 2006 | Abed Holstebro Sejet Tystofte | 20 modern northern European varieties | 79 |
| 2007 | Abed Holstebro Sejet Tystofte | 20 modern northern European varieties | 317 |
| 2007 | Taastrup | 102 old varieties released to the market in the period from 1902 to 1990 | 167 |
| 2008 | Taastrup | 102 old varieties released to the market in the period from 1902 to 1990 | 201 |
| 2008 | Rothamsted | One variety with 19 different fertilizer applications of organic and inorganic fertilizers | 57 |
| 2008 | Holsbebro Søtoften | 10 modern northern European varieties | 80 |
| 2008 | Fyn Holstebro | 5 varieties | 10 |
| 2008 | Hornsherred | 2 varieties at 3 harvest times | 5 |