Exercise 3. Data analysis part II

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07 March, 2024

Overview

In this exercise you will analyze volatilization of ammonia from field-applied manure to try to infer wheather rain has an effect.

1. Read and check data

Read in the data in the files `NH3_emis_rain_interval.csv` and `NH3_emis_rain_plot.csv` and merge by the field plot key `pmid`. Check the data. The relevant columns are

- `pmid`: field plot key
- `cta`: time after slurry application (h)
- `j_NH3`: ammonia volatilization rate in preceding interval (`cta[i-1]` to `cta[i]`) (kg N / h-ha)
- `rain_rate`: rainfall rate in preceding interval (mm/h)
- `air_temp`: air temperature (deg. C)
- `wind_2m`: wind speed (m/s)
- `app_method`: slurry application method

2. Single experimental unit

Plot the ammonia volatilization rate data from plot `pmid` = 2223. Do you see strong evidence of a rain effect? Focus on 50 h < `cta` < 100 h.

3. Multiple experimental units

Can you think of an approach for estimation and evaluation of an overall rain effect using data from all the plots? This is not simple. See how far you can get.