

Crop Data Visualization

The Dangers of under-rotation and clustering
2004-2023

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Problem Identification

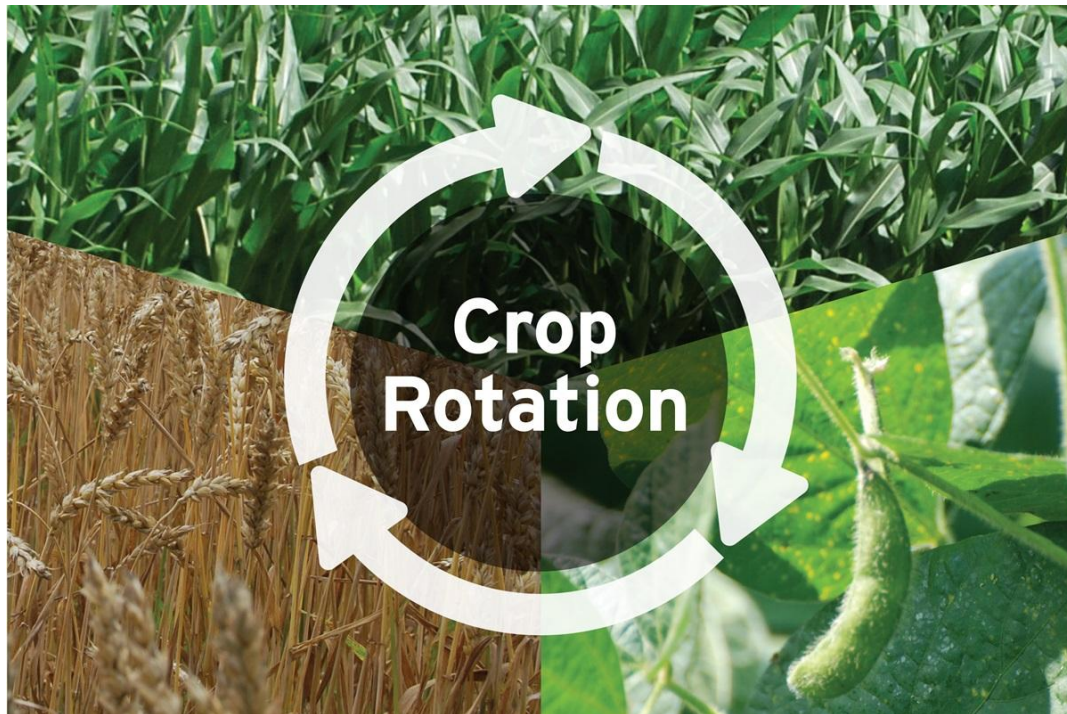


Discover trends in given data

Huge Datasets.

Data Consistency.

Accurate Predictions.





Target Audience



"Crop rotation helps return nutrients to the soil without synthetic inputs, interrupting pest, weed and disease cycles, improving soil health" - Rodale Institute

- Crop Insurance Companies
- Grain Buyers/Fertilizer sellers
- Individual Farmers



**Sollio
Agriculture**



**MacEwan
& Feagan**
INSURANCE BROKERS LIMITED





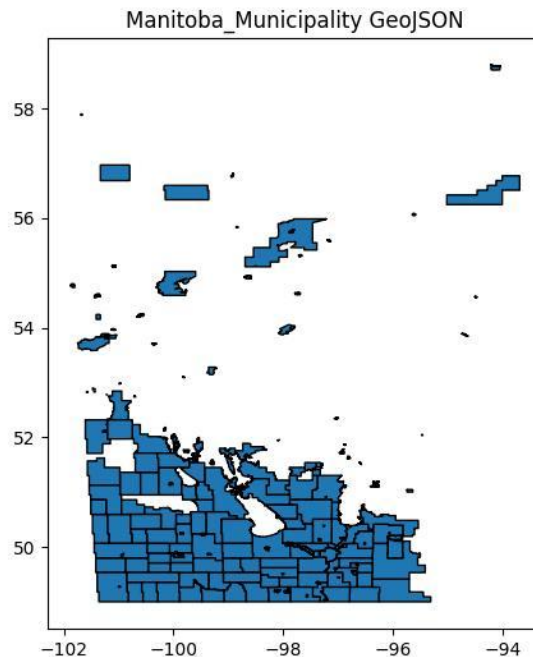
Method

- Python / Jupyter notebook
- Pandas
- GeoDataframe.
- Group by Municipality
- Group by Crop Type
- Group by Year

Produces geographical crop heatmap image

Images saved to heatmap video.

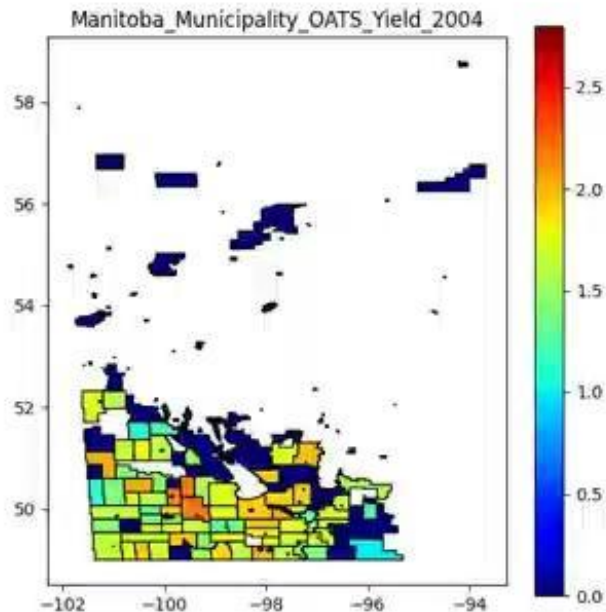
Hotspots located, and final graph created.





Results

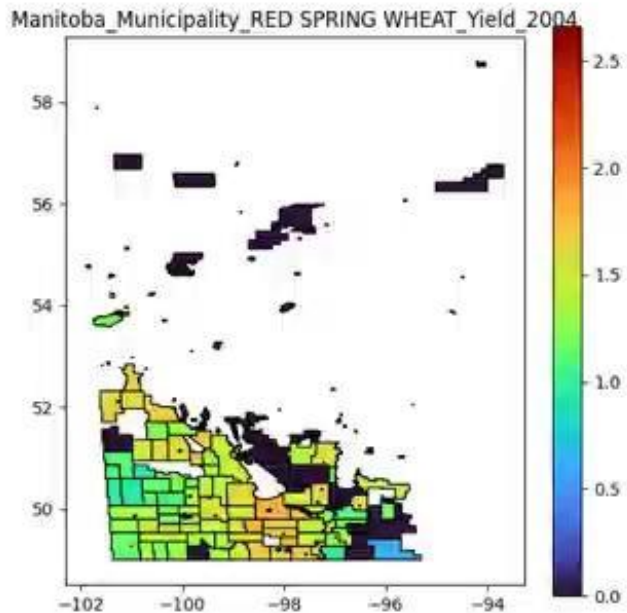
Manitoba Oats Heat Map 2004-2023





Results

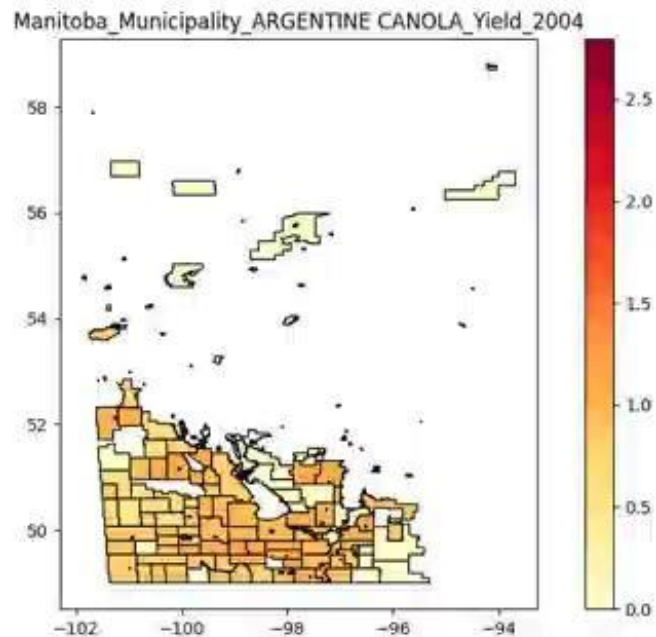
Manitoba Spring Wheat Heat Map 2004-2023



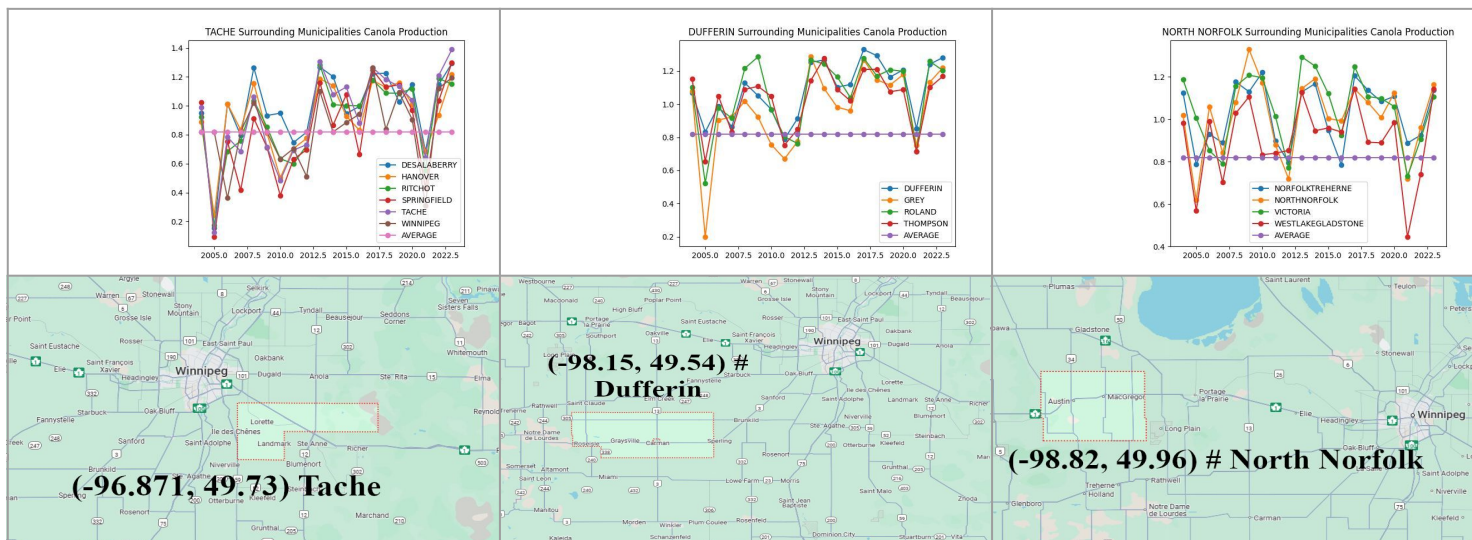


Results

Manitoba Canola Heat Map 2004-2023



Conclusion





Next Steps



- Make into an app, click on municipality, show second graph
- Dynamically load data
- Machine learning predict next years' yield





Appendix



Crop Rotation:

<https://rodaleinstitute.org/why-organic/organic-farming-practices/crop-rotations/#:~:text=Crop%20rotation%20helps%20return%20nutrients.increase%20biodiversity%20on%20the%20farm.>

Cluster Farming Study:

<https://cabiagbio.biomedcentral.com/articles/10.1186/s43170-024-00220-7>

Field seeding

<https://open.alberta.ca/dataset/3decfc22-edbc-4c04-8cd4-39240500eaf2/resource/148f9e8a-40c9-4b6d-9136-405f460e8135/download/2008-519-28.pdf>