Corn Fertilizer Response and Safe Rate Guidance for Various Strip-Till Fertilizer Placements

A Data Management Plan created using DMP Assistant

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Project abstract:

Strip-till is increasingly popular for corn production to reduce tillage costs and soil losses while improving fertilizer/tillage logistics.

Questions from growers adopting strip-till often revolve around fertilizer placement in-strip (maximizing nutrient/crop response, safety) and safe fertilizer rates. Limited guidance exists (OMAFRA agronomy guide strip-till safe rates ignore placement methods, guidelines appear incorrect, origins not known).

This project will investigate 4 fertilizer placements used by strip-tillers (shallow 4” banding, deep 6” banding, mixing throughout strip and banding strip edges). To assess fertilizer response potential and crop safety, 4 common strip fertilizer scenarios (fall potash, spring urea, spring P&K blend, spring N&P&K blend) will be conducted at 6 rates for each placement. Various soil types will be tested (sand, loam, clay loam).

This project will provide growers/agronomists guidance on:
1) which strip placements maximize crop responses to fertilizer
2) safe fertilizer rates that may be applied for common strip till fertilizer strategies

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Data collection

Provide an overview of the data that will be generated, collected or acquired to support this project. If data will be acquired from a third party, specify the source.

Individual corn plant measurement (emergence timing, population, growth stage) and plot-level yield data will be collected over the course of this project. Some analysis will be completed on this data (regressions by fertilizer rates, summarization, variability of measures). This data will be used to determine impact of strip till fertilizer placement and rate on corn growth/development/population and yield.

What method(s) of data collection will be employed?

Plant data will be collected by field observations (plant emergence stakes, counts and leaf counts). Yields are collected by hand harvest/shelling weights or combine harvest correct to standard moisture content.

What types of data will be included?

Numeric data only.

What software or digital formats will be used to collect, manage and analyze the data?

Microsoft excel to store and do some preliminary analysis.
Statistical software (e.g. SAS) will be used for further analysis (regression analysis etc.)

Provide an indication of the scope of the data?

Data will be collected from field trials at 3 farm locations.
Each farm trial will include 384 plots (4 fertilizer placements x 6 fertilizer rates x 4 reps x 4 fertilizer blends).
Each plot will include plant measures from 5m of row length (up to about 32 plants, depending on amount of fertilizer injury).

Data storage

Estimate the size of data storage that will be required.

It is expected <1 GB of data will be generated (excel spreadsheets, statistical software analysis files and output).

Where will your data be stored during the collection, collation and analysis phases of the project?

Data will be stored/used within a password protected OneDrive account. OneDrive account data is backed up to an external hard drive approximately once per month.

What backup strategy will be employed?

Three copies of data will be maintained:
1) The primary working data location will be a OneDrive account
The OneDrive account will be backed up to two locations:
2) Sync.com, an online cloud storage solution already being used for backing up media, and
3) an external hard drive that is located off-site at a home office
Data (raw data, analysis) is backed up approximately once per month. No sensitive (personal or location specific data) is included in this data.

How will your data files be organized? What file naming conventions will you use? A brief overview or example would be adequate.

Data files will be organized within a project folder on OneDrive. Most data and analysis will be contained within one or two master Microsoft Excel workbooks. Individual worksheets will be used as databases for each measure (plant measures, yields). Additional worksheets will be included for initial analysis (variance, averages etc.) or output formats for statistical software. Statistical software files will be included in project folder. Most locations use code names (e.g. "23WEL")

What metadata will be developed for your data? Will there be supplemental documentation prepared to assist with the interpretation and analysis of your data?

In raw data and initial analysis, columns will have simple description names. Units are always included in the row below the column header title.
A README file will be included to fully interpret the data provided. This file will include:
- meanings of any codes used (field locations, measures, file names etc.)
- full descriptions of all treatments (fertilizer blends and placements used)

- data and analysis descriptions (units, description of calculations completed in analysis, meanings of titles)
- basics methods (background agronomic information from field trials, how plant and yield measurements were completed)

Data archiving and preservation

Will you deposit your data in the UG Agri-Environmental Research Data Repository or an external data repository? If you are opting to not archive your data in a repository, where will your data be housed after completion of your project?

Data will be deposited in the UG Agri-Environmental Research Data Repository for long-term preservation.

Discuss any data transformations that will be needed so your data is preserved in appropriate, non-proprietary formats.

Data will be exported from excel as plain text CSV files. Data explanations will be included as footnotes within exported worksheets describing what data in various headings/column titles mean.

If some of your data will not be preserved, how long will you retain it? Will the non-preserved data be destroyed?

No data will not be preserved.

Sharing and reuse

Will the data that you archive in a data repository be made available for sharing and reuse by other researchers?

The data will be made available for sharing and reuse by any other researchers through the UG Agri-Environmental Research Data Repository.

Explain which version of your data or subset of your data will be shared.

All data will be available. No data linking to specific individuals (locations are codenamed) or locations is used in the dataset.

When will your data be available for discovery by other researchers? Will you impose an embargo on publication of your data? If so, please provide details on the duration of the embargo.

No embargo will be imposed on publication of the data.

Will you limit who can access your data? If so, who will that be and why are you limiting the data's reuse?

There will be no limit on who can access the data. No sensitive (name or location specific) data is included.

Are there specific license terms you will assign to users of your data?

The data will be licensed with a CC Attribution-ShareAlike license.

Restrictions/limitations

Are there limitations or constraints on how you manage your data resulting from legal, ethical or intellectual property concerns?

No limitations or constraints for managing data.

Would your data need to be anonymized or de-identified before being shared with others?

Data will not need to be anonymized or de-identified before sharing (specific identifications or locations are not used in the data).

Confidential information

What information do you want to include in your DMP that should not be publicly shared?

Not applicable.

Planned Research Outputs

Dataset - "Corn plant and yield responses to various strip-till fertilizer blends and placements"

The dataset (CSV files exported from Microsoft Excel worksheets) will include raw data and analysis outputs from corn plant and yield measurements in response to various strip-till fertilizer blends placements.

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Corn plant and yield responses to various strip-ti ...	Dataset	2026-03-31	Open	Agri-Environmental Research Data Repository Dataverse	500 MB	Creative Commons Attribution Share Alike 4.0 International	None specified	No	No