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Nitrogen Management Project Protocol
Minimum Data Standard Public Comment Period

Reserve Technical Questions 5:

2x/week is a good standard to aim for in general for the majority of the growing season. This is confirmed by studies such as Parkin, T.B., 2008. *Effect of Sampling Frequency on Estimates of Cumulative Nitrous Oxide Emissions*, Journal of Environmental Quality 37: 4: 1390-1395. In some fine-grained and/or nutrient-rich soils in wetter climates, significant flux events are likely to be missed during the 1x/week period after the 30-day post-fertilizer period; for example following rainfall events, especially if there is substantial N available in the soil either from the soil or from mineralized organic matter. I do agree that there can be some relaxation to 1x/wk but I think 30 days may not be long enough. I'd feel more comfortable with 60 days following any agronomic event (e.g. tillage), or until soil temps drop below 5 C in the fall. We also decrease to 1x/week in some of our well-drained soils starting around Sept 1 based on many previous observations showing that the soil in question is not responsive to rainfall events during this period.

Reserve Technical Questions 6:

Year round measurements can be quite challenging to perform in these environments. Due to the potential for extreme flux events, measurements during freeze/thaw periods (not necessarily year round measurements) should be considered especially when the management practice under investigation (e.g. tillage) would be expected to alter physical soil properties (e.g. albedo, temperature, drainage) during the freeze/thaw period or if a fertilizer management practice (e.g. slow release fertilizers) might be expected to alter soil N availability compared to a baseline or business as usual practice. In other cases, if it can be reasonably assumed or if it can be confirmed by measurement (e.g. of soil N availability the previous fall) that the practice under investigation does not alter these factors, then the measurements might not be needed. In this case of course, growing season fluxes would be the metric, not annual fluxes.

Reserve Technical Questions 7:

My opinion is that soil properties including texture, drainage class, organic matter content, and temperature are the most important variables that should be considered in extrapolation; this is of course in addition to climate variables including rainfall amounts and frequency and temperature, and management practices. I am not so familiar with the regional definitions to comment on to what extent they capture these characteristics.

Reserve Technical Questions 12:

I'm not totally clear what is meant by power analysis – do you mean prior to the study to help determine degree of replication required to detect significant differences, or do you mean some type of meta-analysis after the study has been done? In either case, it is a good idea, and the Reserve could help to facilitate communication among researchers as a means of promoting this.