

Grant Name - Identifying Nutrient Loss Hot Spots in Tile Drainage

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Objectives

1. Collect and analyze bi-weekly tile drainage samples, flow rates, and nutrient load from 15-20 fields across eastern South Dakota representing a range of soil types and practices.
2. Determine what impact soil type, precipitation, crop growth, crop type, cropping history, and nutrient management has on nutrient loss.
3. Recommend prioritization of edge-of-field practices based on what variables are most likely to contribute to nutrient loss.

Results

The project has identified a total of over 50 tile outlets of participating landowners: eight near Brookings/Nunda, sixteen near Garretson/Crooks, plus two more, twelve near Watertown, five near Salem, three near Canton, three near White, one near Baltic, one near Montrose, one near Alexandria, one near Arlington. Of these, 25-30 were chosen to be regularly sampled: one near Nunda, two near White, two near Canton, three near Salem, seven near Hazel, nine near Garretson, and six near Crooks. The tile outlets were selected because they represent a range of characteristics: corn, soybeans, small grains, vertical till, no-till, conventional till, large drainage areas, small drainage areas, a variety of soil types, and so on.

Impacts

Thus far, the main impacts have been conversations with producers about nutrient loss, water management, and water quality. Long-term impacts will be a better understanding of nutrient concentration and load in tile drainage in eastern SD and factors affecting nutrient loss. Initial contact was made with producers in February, 2020 with site visits planned immediately after snow melt (late March or early April) and sampling starting immediately thereafter. Due to COVID-19, this project was not deemed essential and since it was a new project with significant travel and potential public contact, it was not approved to commence as scheduled. Since the pause in SDSU research occurred March 16, site visits did not occur until June and sampling began in late June/early July.

Changes in Project Personnel

In addition to research challenges related to COVID-19, Dr. Rachel McDaniel left SDSU and the project which also hindered the project. A technician position was advertised, but the hiring process was paused until June since it was uncertain if the project would happen in 2020. The hiring is moving forward and a finalist has been identified. A current technician in the ABE department is helping on the project temporarily.

Budget

Due to research restrictions from COVID-19, very little of the budget has been spent. A small amount of salary has gone to a graduate student to support reaching out to producers, helping set up visits, and taking farm visits. Because of the uncertainty, the project team decided it was best to not put the project in a position of having to spend money (by hiring a technician) that was not going toward

accomplishing the project. For this reason, 99% of the funds awarded are still currently still available, but expenditures will increase now that the project is moving forward.

	Sample Analysis	Senior Personnel	Student Support	Travel	Total
Year 1	\$ 8,400	\$ 46,421	\$ 9,422	\$ 3,500	\$ 67,743
Spent	\$ 0	\$ 0	\$ 443.34	\$ 0	\$ 443.34
Remaining	\$ 8,400	\$ 46,421	\$ 8,978.66	\$ 3,500	\$ 67,743
Year 2	\$ 8,400	\$ 46,421	\$ 6,772	\$ 4,500	\$ 66,093
Year 3	\$ 8,400	\$ 46,421	\$ 6,772	\$ 4,500	\$ 66,093
Total	\$ 25,200	\$ 139,263	\$ 22,966	\$ 12,500	\$ 199,929