Biomass Buffers and Silt Socks

Project Introduction

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Project title: Evaluating the technical and economic feasibility of harvestable biomass crops as regenerative buffer strips and silt sock packing for nutrient runoff control

Duration: Three years

Key collaborators: Ontario Biomass Producers Co-operative, Dr. Mahendra Thimmanagari (OMAFRA), Jake DeBruyn (OMAFRA).

Research team: Tianying Li, Ogochukwu Udume, Dr. Hiral Jariwala, Dr. Fatima Haque, Dr. Emily Chiang

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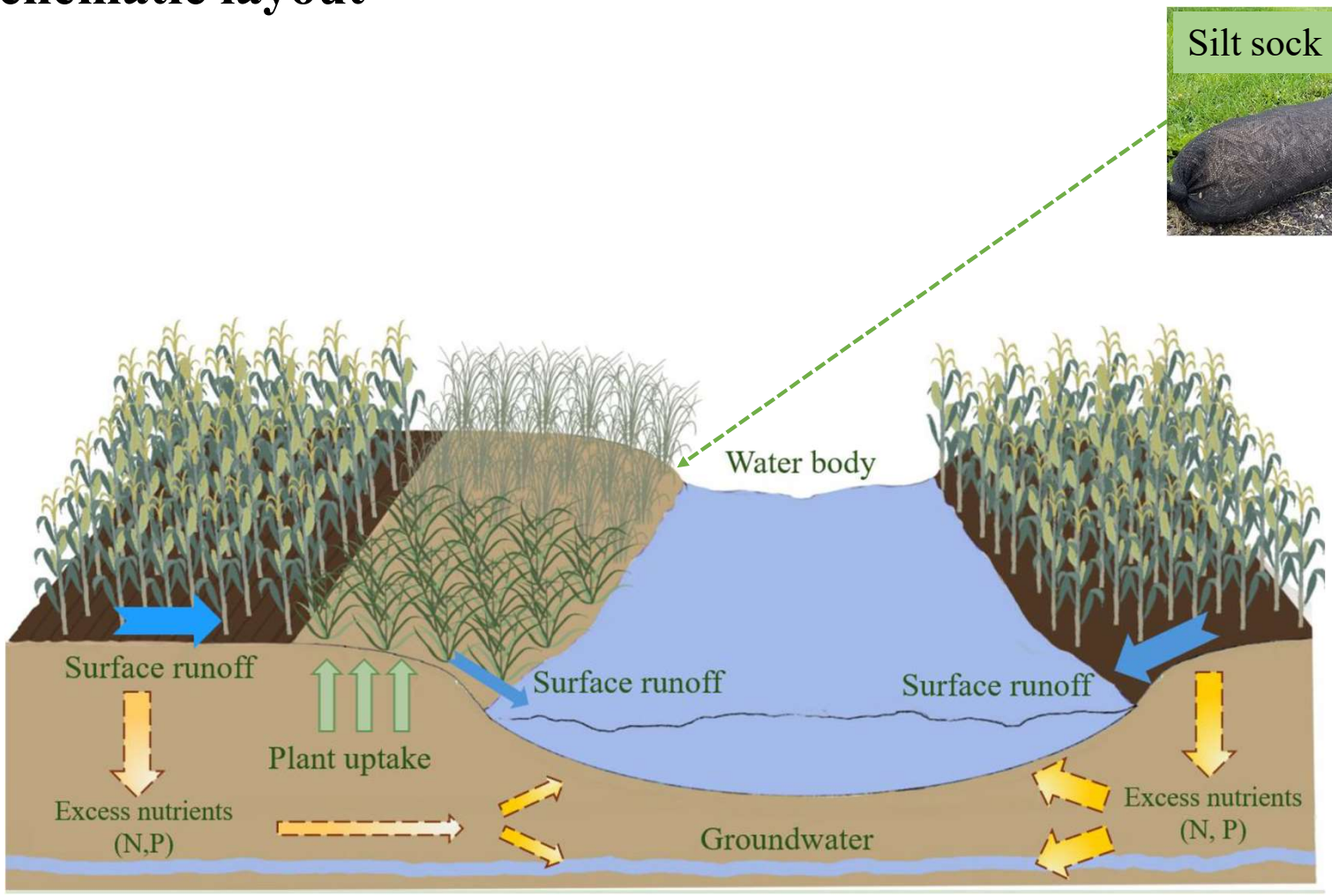
Schematic layout



Key Objectives

Assess the techno-economic feasibility of employing biomass crops (miscanthus or switchgrass) as harvestable and regenerative buffers and silt socks.

- Investigate, through laboratory and field trials, the effectiveness of biomass buffers in retaining P from overland run-off and subsurface-lateral flows.
- Investigate harvested biomass to be used as filter media in silt socks for effectiveness in retaining sediment for erosion control.
- Adapt existing tools for the planning and implementation of vegetative buffers, such as the SWAT, AgBufferBuilder, to account for the specific effectiveness and requirements of harvestable biomass buffers.
- Engage key participating stakeholders (OMAFRA, OBPC, TPS Biomass) to ensure that knowledge gaps and uncertainties are addressed, and project outcomes are translated and adopted into practice.

Work to date

Field Sampling (Summer 2023)

Miscanthus and switchgrass Sampling

Work to date

Field Sampling (Summer 2023)

Site 1:

Upstream: 43°35'55.5"N 81°38'00.1"W

Downstream: 43°35'55.5"N 81°38'00.7"W

Plant: Soybean (left), white beans (right)

Buffer strip: Miscanthus

Work to date

Field Sampling (Summer 2023)

Site 2

Upstream: 43°35'53.3"N 81°37'55.9"W

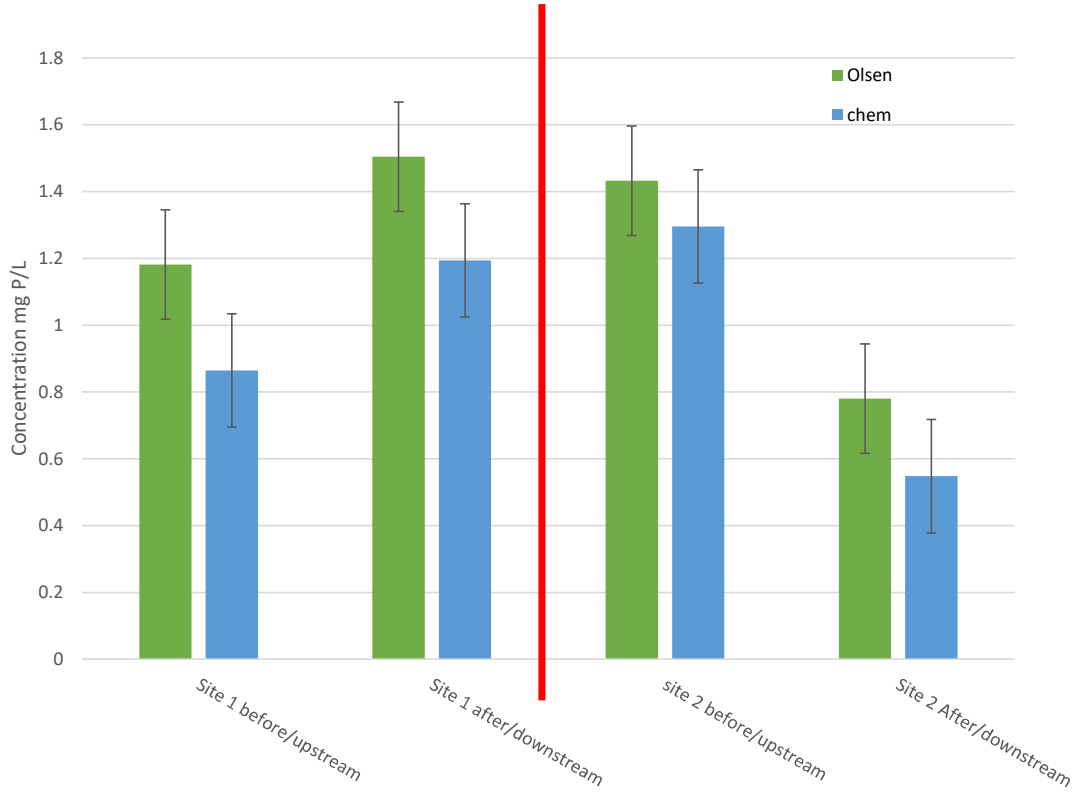
Downstream: 43°35'53.0"N 81°37'55.8"W

Plants: Soybean, forest

Buffer strip: Miscanthus

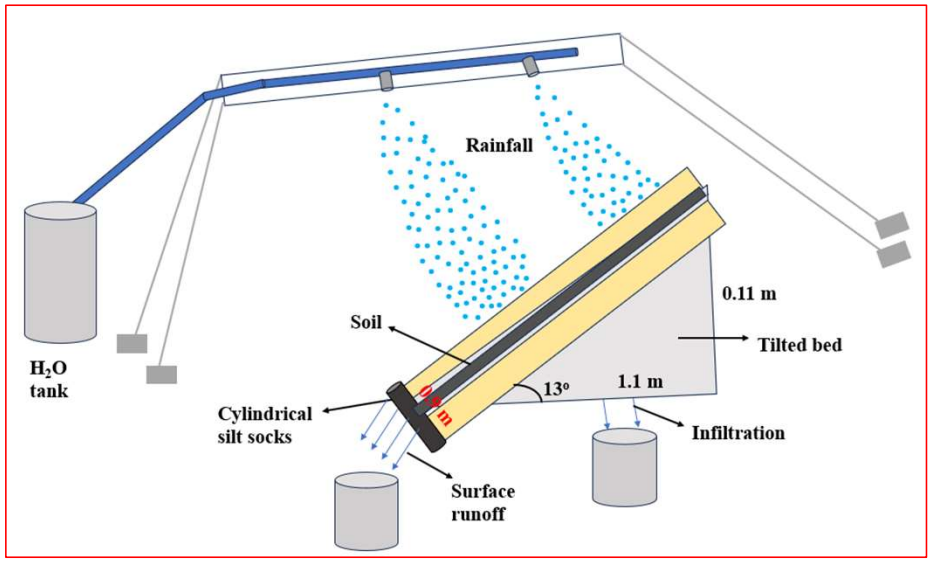
Work to date

Soil P was extracted based on the Olsen P method and chemical method



Work to date

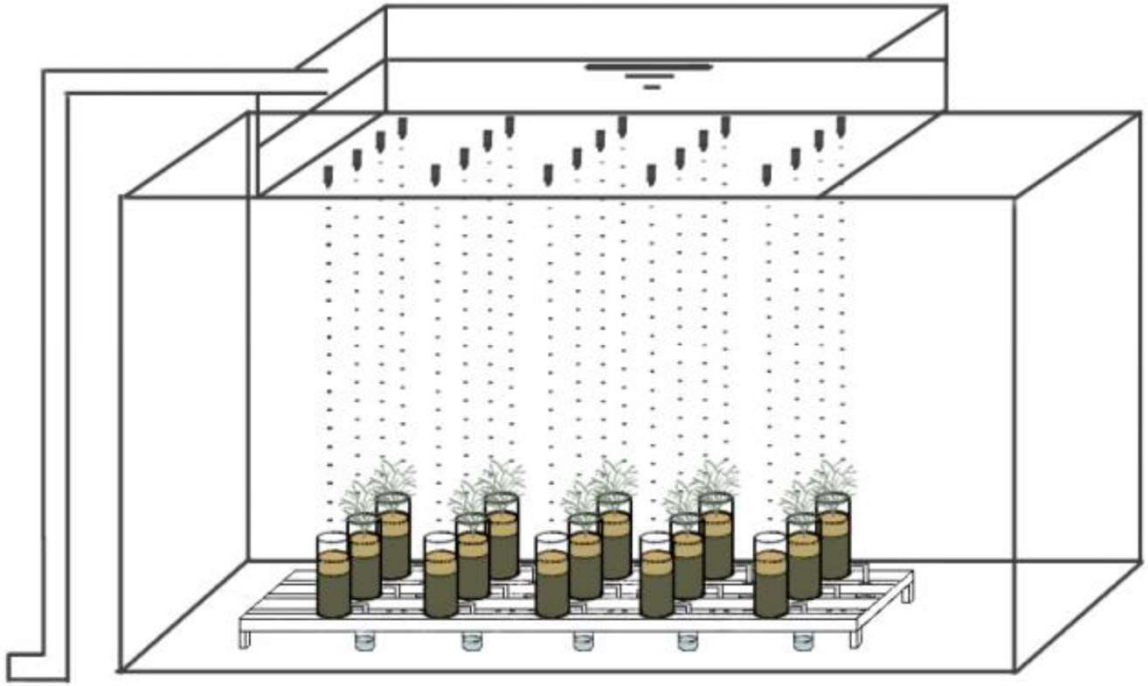
Greenhouse silt sock test set-up

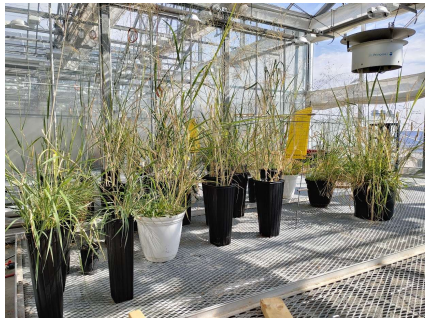


References:
ASTM standard D6459 − 19
ASTM standard D3977 − 97

Work to date

Greenhouse Buffer test set-up





Thank you

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