

## Farm Adaptation Innovator Program

# Impacts of Tile Drain Cleaning Over One year in Delta, British Columbia

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### Geographic Applicability

This study was conducted in Delta; findings should be applied only to locations with humid maritime climate and poorly drained, silty soils

### Commodity Relevance

This study was conducted on blueberry and vegetable crop fields but findings may also be applied to other crops

### Time Frame

Fall 2015 - Spring 2017

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## Background

Periodic inspection and maintenance is recommended to keep drain tiles functioning in the long-term. Well-functioning drain tiles may be an important tool to help farmers to adapt to climate change. When performance is reduced, cleaning of tiles by flushing may be an effective way to remove sediment or iron ochre buildups, thereby restoring effectiveness and extending their lifespan. Best carried out in the fall or spring, when water levels are adequate in ditches for pumping and no activity is occurring on the field, drain cleaning can range in cost from \$50/acre (at 60 ft spacing) to \$200/acre (at 15 ft spacing). While tile cleaning may be a recommended practice, in a recent survey of farmers in Delta, BC, it was clear that they were uncertain about the actual benefits. To address this uncertainty a research project was initiated to evaluate the efficacy of tile drainage cleaning in blueberry and vegetable crop fields across Delta, British Columbia. Tiles were cleaned in a section of 10 fields in the winter/spring of 2016/2017 and the cleaned/un-cleaned monitored for 1-1.5 years.

## Study Objectives

- Investigate tile cleaning effectiveness in terms of water table depth in blueberry fields, and soil moisture soil and workability in vegetable crop fields.
- Calculate the number of extra workable days gained by cleaning tile drains
- Evaluate the impact of tile cleaning on soil salinity

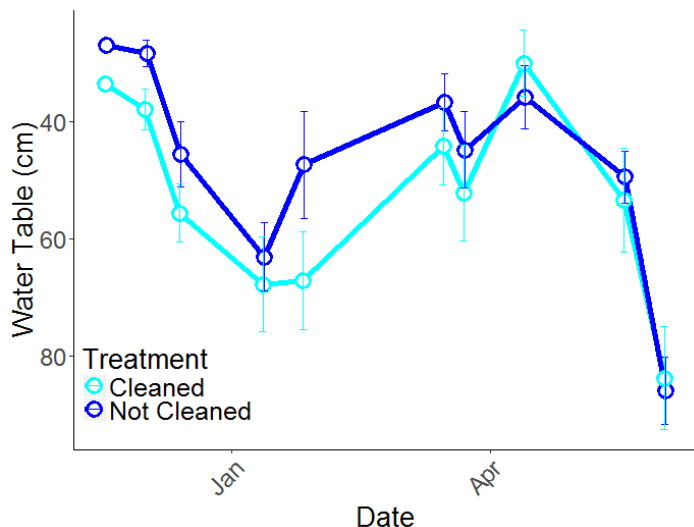


Figure 1: Water table (depth below surface, cm) in **blueberry** fields which have been cleaned or not cleaned from November of 2016 to June of 2017 (10 – 18 months after tile cleaning)

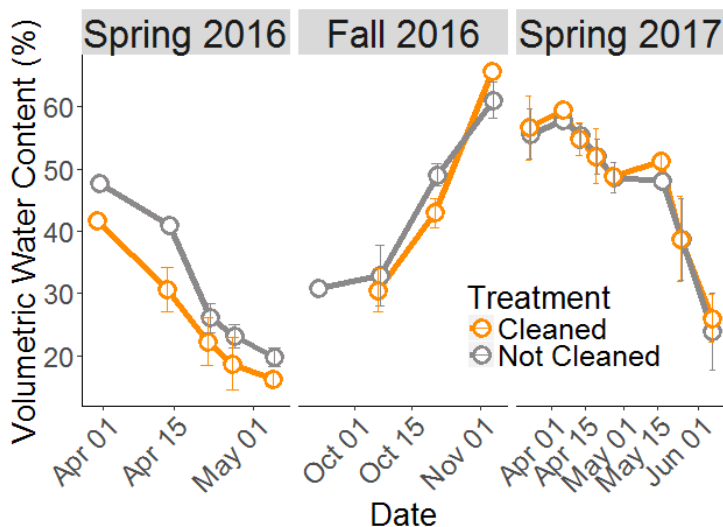


Figure 2: Soil Volumetric Water Content (%) in **vegetable** fields which have been cleaned or not cleaned from March 2016 – June 2017 (3 – 18 months after tile cleaning)

### For more information:

For more details on the results of this project visit the Climate Action Initiative website:

<http://www.bcagclimateaction.ca/faip-project/fi13/>

and the Sustainable Agricultural Landscapes Lab website:

<http://sal-lab.landfood.ubc.ca/projects/delta-drainage-project/>

For more information on drainage management visit the BC Ministry of Agriculture website:

<http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/water/drainage>

## Results

- Tile cleaning lowered the water table in blueberries by 13% (marginally statistically significant,  $p=0.06$ ) between November 2016 and June 2017 (Fig 1).
- In vegetable crop fields, the data showed a trend of lower soil moisture in the spring immediately following cleaning (Fig 2). In the fall of 2016 and spring of 2017, which was unusually wet, this trend was no longer evident. Differences in soil moisture were not statistically different.
- Tile Cleaning had no statistically significant impact on the total number of workable days calculated for the production season between the spring and fall of 2016. The data however showed a trend that Cleaned fields had more ( $187 \pm 12$ ) workable days than Not Cleaned ( $175 \pm 7$ ) (Fig 3).
- Based on these differences, twelve extra workable days per year would be gained at a cleaning cost of \$10/additional workable day/acre
- The clearest effect was in the spring of 2016, immediately after cleaning.
- Drain cleaning did not reduce salinity after one year.

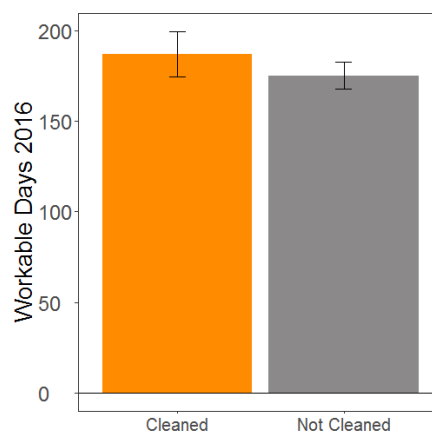


Figure 3: Observed workable range (number of days between first observed workable day and final observed workable day) in 2016 on **vegetable** fields which have been cleaned or not cleaned

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Canada<sup>2</sup>