



## Case Study - Two-Stage Ditch. Dalhousie University, Bible Hill, Nova Scotia.

*The Ditch Doctor® method was faster, more cost effective and kinder to the local environment. More land was accessible sooner with higher crop yield the same year. The Two-Stage ditch has great advantages over conventional ditching.*



**BEFORE** - "The slopes of the ditch aren't touched, they are just sprayed with spoil. This is very useful in preventing erosion and reduces runoff into the ditch."



**AFTER** - "The Ditch Doctor® attachment is cheaper and faster. It's more cost effective to use the Ditch Doctor® because for the same amount of money, many more meters of ditch can be done. Using the attachment keeps the fields in production and it improved water drainage quickly."

Dalhousie University Faculty of Agriculture works with industry, government, and research institutions to perform innovative research that helps to create new technologies for environmental sustainability that supports both the agri-food and aquaculture industries. We had the opportunity to collaborate with Jean Lynds, Crops & Ruminant Coordinator in some fields on their 250-hectare farmland. The project would compare the Ditch Doctor® with the conventional bucket and excavator to create, restore and maintain ditches in wet and dry marshland conditions.

The ditches had previously been maintained with the conventional bucket and excavator method. This resulted in the area being saturated for several months at the beginning of the season. The project was to revisit these ditches this time with the Ditch Doctor®. Without disturbing the slopes of the ditch to prevent erosion back into the ditch the silt and sediment was distributed evenly and drainage was quickly restored. There was no need for any additional levelling of the silt and sediment on the banks and no need for trucking away excess material as is often the case with the conventional method. It required less time to do the same distance with the cost per meter of ditching significantly reduced.

Where ditches were heavily clogged or almost entirely lost they had to be fixed or created, more than merely maintained. The Ditch Doctor® is capable of working in up to three feet of water and was able to restore and create a ditch in both wet and dry conditions. Land adjacent to the ditches is no longer water saturated, of higher quality and free of weeds. Access for farming machinery closer to the ditch was reinstated so this land that was redundant was planted with crop earlier in the season and harvested resulting in a higher yield.



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**Two-Stage Ditch** - *“The Two-Stage ditch requires less maintenance. The one-stage ditch fills in with silt and sediment quicker and requires more maintenance. It’s good to keep the ditch’s slopes covered in vegetation to prevent erosion.”*



**CREATE, RESTORE and MAINTAIN** - *“The Ditch Doctor® attachment was able to fix existing ditches and cut ditches through ground that was completely clogged with material where ditches used to be.”*

The lower main channel in the Two-Stage ditch drains water in the low flow season and the upper channel manages water during the higher flow season. This combined with the undisturbed vegetation on the slopes reduces the erosion of silt and sediment back in to the ditch that now requires only routine maintenance.

In a separate report commissioned by Ditch Doctor® “The Benefits of Two-Stage Ditches”© (Prof. Hany El Nagggar, Ph.D, P.Eng., Dalhousie University, Department of Civil and Resource Engineering) Prof. El Nagggar describes how Two-Stage ditching has great advantages over conventional ditching. Improved drainage and ecological benefits are two of the conclusions. Further studies by academic institutions referencing Two-Stage ditching support these and other benefits. There is limited awareness and adoption of Two-Stage ditching in part because the initial cost to create a Two-Stage ditch using the conventional bucket and excavator method is high.

Ditch Doctor® is helping to change this by increasing awareness about the economic and environmental advantages and lowering the cost of creating a Two-Stage ditch. In many cases there will be little difference in the cost of a Two-Stage ditch with the Ditch Doctor® method compared to a one-stage ditch with the conventional bucket method. This provides all the advantages of a Two-Stage ditch plus the environmental benefits of using the Ditch Doctor® that are becoming increasingly more important.

Where a ditch is already established, either one-stage or Two-Stage, maintenance is faster, required less often and more cost effective with the Ditch Doctor®.



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**BEFORE** - "The fields are accessible earlier due to the improved drainage. Because the fields are on marshland, they are always wet early in the season."



**AFTER** - "Better crop yield this year. We can get farm equipment much closer to the ditches so the area is farmable and not being lost to weeds."

Adam Fisher, President of Ditch Doctor® has extensive practical experience of ditching and a proponent of the Two-Stage ditching method. Adam frequently works with land owners, municipalities, farmers, Universities and others to help raise awareness of the advantages Two-Stage ditching offers. Studies like these by Dalhousie University provide compelling evidence ditch management is changing and that a combination of cost effective and environmentally friendly Two-Stage ditching will be part of that change.

Click on the links below to learn more.

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*We respectfully acknowledge the support of Dalhousie University Faculty of Agriculture, especially Jean Lynds, Crops & Ruminant Coordinator as the project leader. Students for gathering the data, images and the Questions and Answers session.. All "quotes" below images are from the Questions and Answers session with Jean Lynds several months after the project was completed and reproduced with permission. The "Benefits of Two-Stage Ditches" report submitted to Ditch Doctor® by Prof. Hany El Nagggar, Ph.D., P.Eng. is also acknowledged and available on request. All Ditch Doctor® ditching was performed by Adam Fisher, President of Ditch Doctor® Atlantic Ltd.*

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