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Listen to the genes

Using Nanopore sequencing to identify early indicator genes differentially expressed upon 1-MCP treatment in pear

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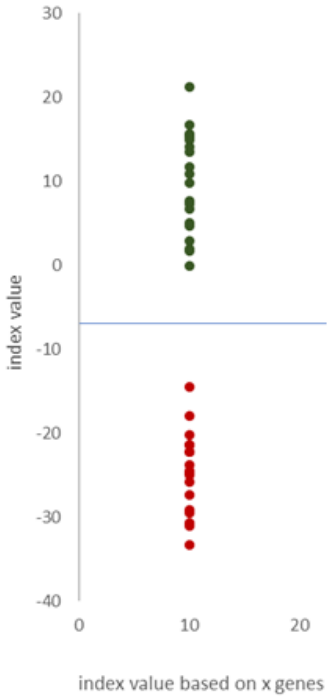
Introduction

- Apples and pears are often treated with 1-MCP to improve shelf life and storability.
- It is not allowed to use 1-MCP in the organic industry.
- The FreshNSure test determines whether a batch of apples/pears have been treated with 1-MCP.
- The test measures the activity of ripening related genes.
- The test is developed to be used 3-9 months after 1-MCP treatment.

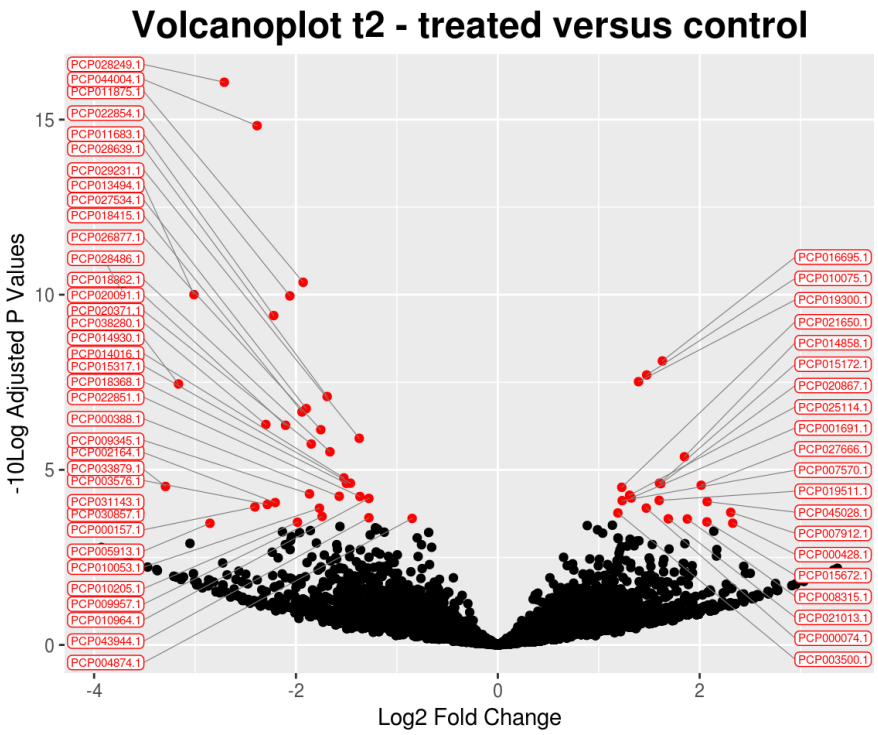


Aim of the project

- Pears are not always receptive towards 1-MCP.
- Aim: develop a test that can determine whether a treatment was successful. -> identify early indicator genes
- Sequenced untreated and 1-MCP treated pears, 1 and 2 weeks after application. -> focus on 2 week (4 samples)

Batch	1-MCP
1	Yes
1	No
2	Yes
2	no

Results



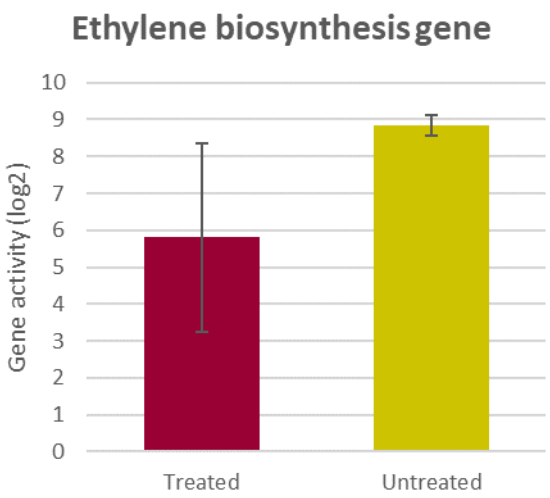
- 56 transcripts were significantly differentially expressed (BH adjusted p-value <0.05).

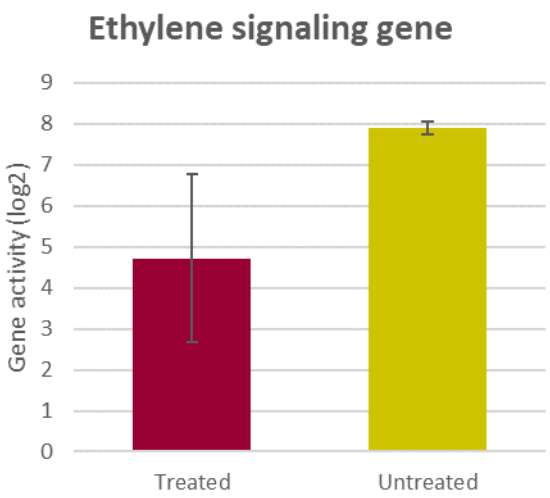
Results

Enriched biological processes

GO term	Biological process
GO:0009693	ethylene biosynthetic process
GO:0009692	ethylene metabolic process
GO:0009835	fruit ripening
GO:1900674	olefin biosynthetic process
GO:1900673	olefin metabolic process
GO:0043449	cellular alkene metabolic process
GO:0043450	alkene biosynthetic process

1-MCP blocks the ethylene receptor





Indicator genes for future test