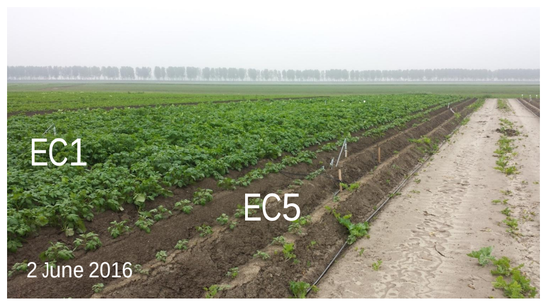

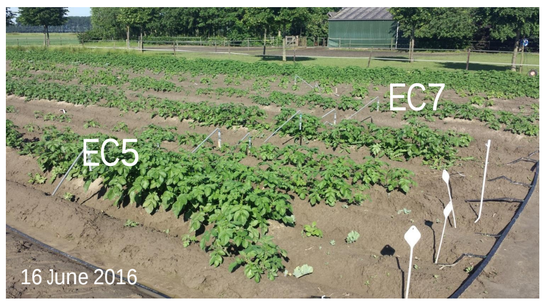

In search of a salt tolerant potato to reduce the freshwater demand in saline coastal areas

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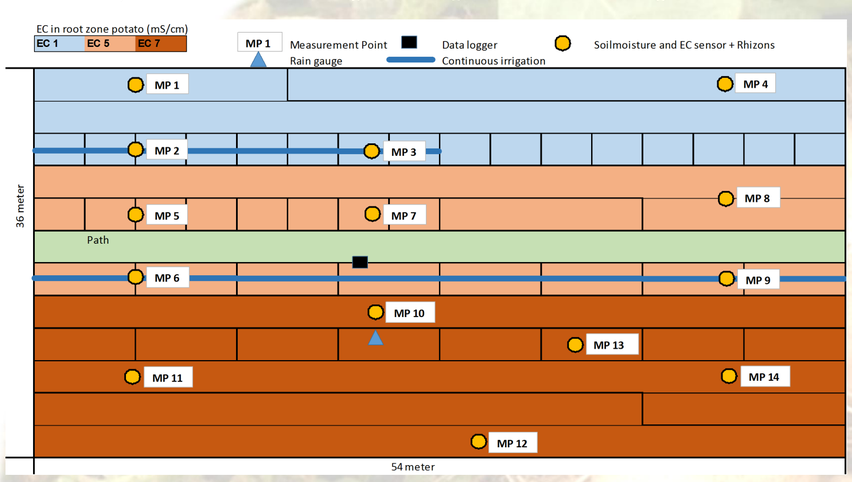
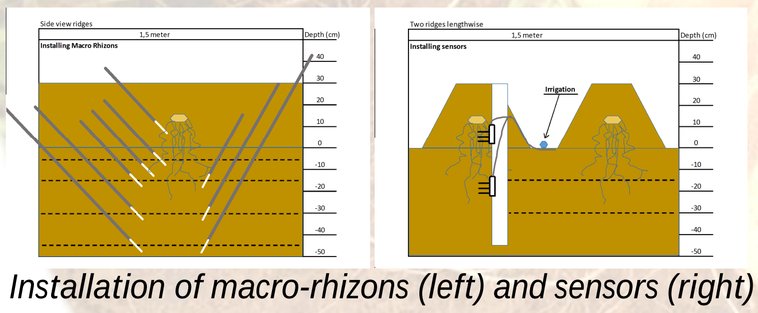
In many coastal areas, groundwater is brackish to saline which may pose problems for the sustainable exploitation of fresh groundwater. Climate change and future rise in sea level are expected to reduce the availability of both fresh surface water and groundwater. Nowadays, much research is focused to increase the freshwater supply. In this project we try to reduce the freshwater demand, which is another strategy to cope with salinization and climate change. At an agricultural field (0.2 ha) in the province of Zeeland (The Netherlands), 25 different potato varieties are being tested under different soil moisture salinity regimes (including a fresh reference case). The salinity of the root zone is controlled applying salt grains and drip irrigation with brackish water. The soil moisture content and salinity is monitored every hour with 20 automatic sensors, installed in the root zone of the potato. Weekly, the soil moisture is sampled using macro-rhizons at 5, 15, 30 and 45 cm depth at 14 different locations, and the salinity is determined. Also, the status of the potato plant (plant size, leave size, leave color, root density), is monitored weekly. The dynamics of the soil water content and salinity under different salinity and meteorological regimes are being modeled with HYDRUS 2D. Results shown on the poster are from two growing seasons, 2015 and 2016.

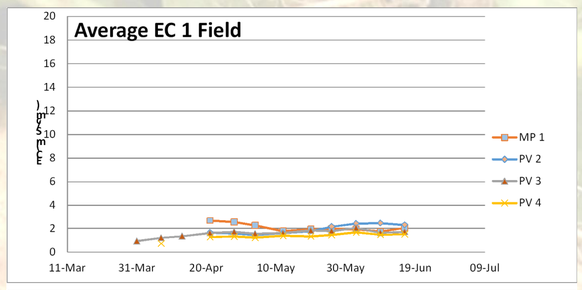


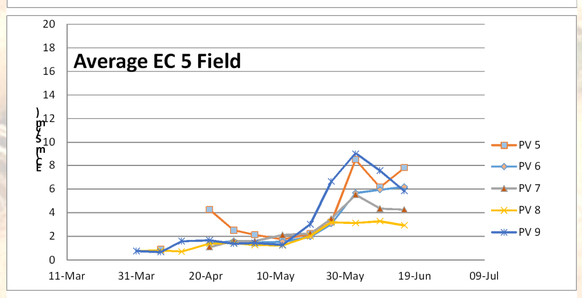
Set up of test field with parts of different salinity (EC1, EC5, EC7) and set up of monitoring network. At all 14 locations macro-rhizons and soil moisture sensors are installed

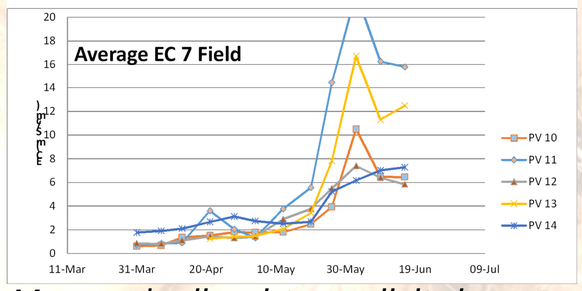


Installation of macro-rhizons (left) and sensors (right)

HYDRUS-2D simulation. Migration of salt front of 2 different ways of salt application.

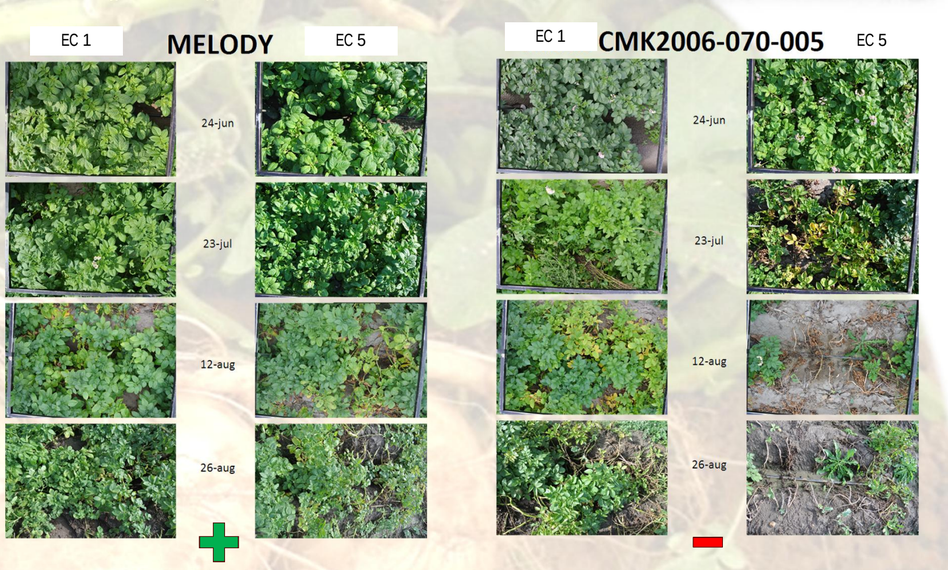




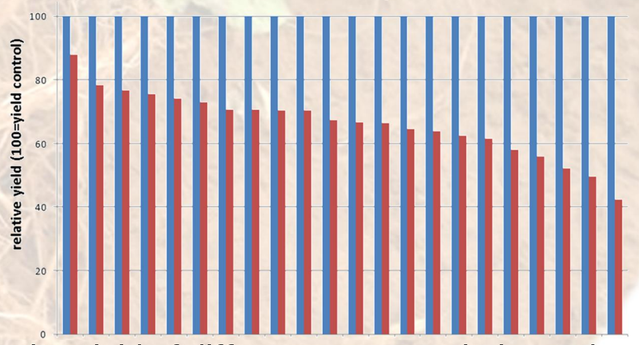


Measured soil moisture salinity in root zone, Soil moisture is sampled in macro-rhizons

Continuous registrations of salinity and soil moisture content in root zone of potato, using Decagon sensors.



Canopy of 2 varieties under normal (EC 1) and saline conditions (EC 5). There is a clear varietal difference in decay of canopy due to salinity. Variety melody is more tolerant than variety CMK2006-070-005.



Relative yield of different potato varieties under saline regime (red) compared to normal conditions (blue)

Towards a salt tolerant variety. Comparing DNA of salt tolerant and intolerant plants to find genes responsible for salt tolerance.

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