

HIP-BB1.2 'Getting to the Roots of Stress Resilience of Potato Plants'

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The goal of this project is to gain insight in the role of the root system in tolerance to stress conditions (salinity and low Nitrogen availability).

Roots are notoriously difficult to investigate, as these are underground structures. Yet, roots are the first to sense many environmental stresses like drought, salinity and low nutrient availability, and root structure and specific water, ion and nutrient uptake properties are at the basis of tolerance mechanisms that may enable crops to maintain an appreciable yield under stress conditions.

In this project we are assessing variation in and genetic control of the response of roots to soil salinity and low N availability, and the consequences for growth of the crop.

Highlights:

In the first year, we started with development of a method and protocol to assess root structure variation. Several potato lines were grown on vertical agar plates in which the roots are visible and can be imaged. We are optimizing conditions (light, media) first for evaluation of the salinity response using a limited set of diploid potato lines. In the meantime, seeds of a larger set of lines are produced. These will be used to assess variation in root structure and root structure adaptation in 2020.

Bottlelenecks:

We started relatively late in 2019 because the PhD candidate was available from September 2019. The project is now producing its first results.

Planning:

With a start in September 2019, we will be able to proceed as planned. In 2020, a broad set of diploid potato will be evaluated for variation in the response of the roots to Salt stress and low N availability, and genetic variation identified. Contrasting performers will be selected for a more in depth analysis. In vitro plants and tubers will be collected of commercial potato varieties for evaluation in hydroponics (2nd half of 2020/beginning 2021) and aboveground response evaluation in soil.

Products:

No products have been developed at this time.