Promoting production and use of organic potatoes in Northern Ostrobothnia, the northernmost agricultural area in Europe

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Implications
The results produced in this on-going study will help to develop more effective cultivation methods for organic potato production especially in northern climate conditions and, consequently, promote the production and use of organic potatoes. The study contributes to solutions for more productive and sustainable organic farming (Track 1).

Background and objectives
The demand for organic products is increasing in Finland. The aim of the governmental development programme launched in 2013 is to increase the area under organic production to 20 % by the year 2020 (Ministry of Agriculture and Forestry 2014). Potato is an important part of the Finnish diet with around 60 kg of potatoes per person consumed annually. The demand for organic potatoes and potato products is also increasing. However, currently only around 1 % of the potato crops are grown organically (Luke 2017), and neither the volume nor the quality meets the expectations of the consumers and professional kitchens. Organic potato production faces many challenges including lack of suitable cultivars and fertilisers and difficulties with disease control, all of which may contribute to low yields in organic production (Varis et al. 1996; Finckh et al. 2006). Northern Ostrobothnia, the northernmost agricultural area in Europe, has excellent natural conditions for potato production despite the short growing season. It has a long history in production of seed and table potatoes, but produces only small amounts of organic potatoes. The main objective of this work is to promote the production and use of organic potatoes in Northern Ostrobothnia.

Key results and discussion
The project started in 2016, and hence, only preliminary results are available. In the first year of the project, data was collected from two field experiments carried out in organic potato farm in Northern Ostrobothnia. The growing season was warm and wet. As the weather conditions were conducive to late blight (*Phytopthora infestans*) infections, first symptoms were detected early, only 50 days after planting. Late blight epidemic developed rapidly, and foliar blight reached 100% 30 days after first appearance on the most susceptible cultivar tested. Total yields varied between cultivars from 5 to 14 t/ha, whereas the average for the area was 11.6 t/ha (Luke 2017). The marketable yield ranged from 60 to 80 %, and was mostly reduced due to small tuber size (< 30 mm), quality defects such as greening and symptoms of late blight and black scurf (*Rhizoctonia solani*). None of the biological control products tested for control of soil- and seed-borne diseases other than late blight affected the quantity or quality of the crops. Although late blight was not in the focus of this work, the weather conditions conducive to the infection lead to an early onset of the epidemics and together with excessive rainfall had a detrimental effect on yield. This emphasizes the vulnerability of the organic potato production in northern latitudes and calls for methods that can make the best use of the short growing season efficiently.

According to the kitchen survey, over 80% of the professional kitchens in the area (n=33) are interested in using organic potato products of some kind. However, availability and price limit the use of these products at the moment. The preliminary results from the farmer survey indicated that farmers are especially concerned about issues on plant protection, fluctuations in yield quantity and quality as well as pricing.

How work was carried out?
The project is implemented in four work packages:

1) New cultivars and different types of fertilisers potentially suitable for organic potato production are introduced and their effect on yield quantity and quality tested in growers' fields.
2) The impact of diseases besides late blight is assessed and the efficacy of different biological control products for control of these diseases is investigated in organic potato production. In addition, methods for early detection of pathogens latently present in the seed potato are optimised.
3) The factors limiting the use and production of organic potatoes in Northern Ostrobothnia and willingness of growers to convert to organic production are investigated through surveys to professional kitchens and growers.
4) The interest towards production and use of organic potatoes is raised by organising field and kitchen demonstrations, which are open to professionals and the general public alike.

References

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