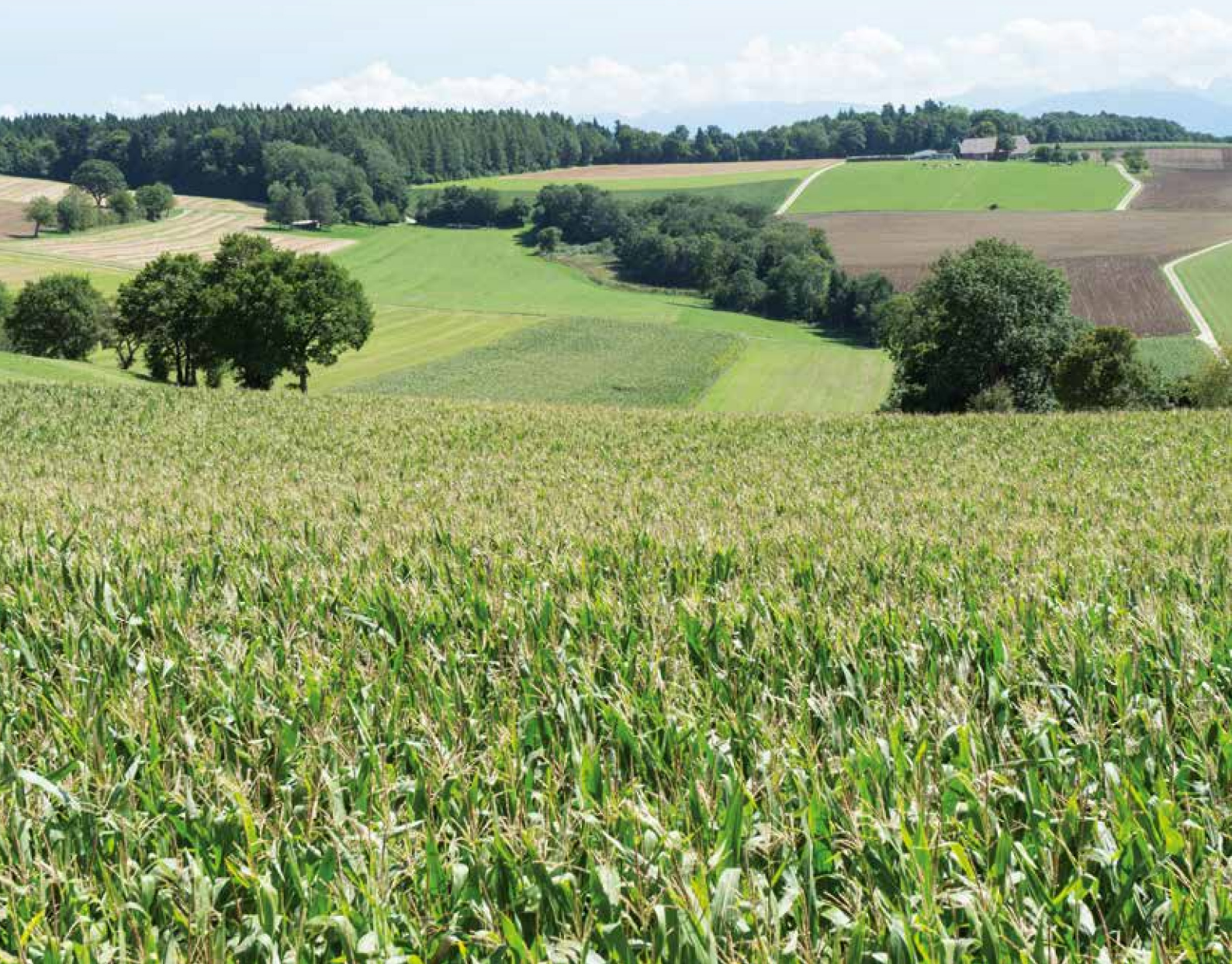
ESA2018

XV[e] European Society for Agronomy Congress

August 27-31, 2018 - Geneva, Switzerland

www.esa-congress-2018.ch

ABSTRACT BOOK



7. PARALLEL SESSION 3.2 – BIOTIC STRESS AND CROP PROTECTION

PS-3.2-01

Monitoring Black dot and Silver Scurf in Commercial Potato Crops from Plantation to Shop Shelf

Andreas Keiser, Martin Häberli, Benno Jungo, Elena Dubois, Jürg Moser, Patrice De Werra

School of Agricultural, Forest and Food Sciences HAFL, Bern University of Applied Sciences BFH, Switzerland

Abstract: In recent years, silver scurf (Helminthosporium solani) and black dot (Colletotrichum coccodes) have caused significant economic losses along the potato supply chain in Switzerland. In this monitoring project, disease development in 25 commercial potato crops is being evaluated over a three-year period (2016-2018) from plantation through storage to packaging. The soil inoculum levels of black dot and silver scurf are being analysed by qPCR, and seed quality by qPCR and visually. Tuber samples at various dates from tuberisation to packaging are being analysed with qPCR and visually. Crop management data and all relevant site parameters are being collected. Results are available for 2016 and 2017.

For black dot, higher disease levels were most often found in fields with higher soil inoculum. The average soil inoculum level was higher in crop rotations with three- or four-year intervals compared to five or more years. Exceptionally, higher soil inoculum levels were found in rotations with longer intervals between two potato crops. Higher levels of black dot on progeny tubers at harvest were also observed in some fields where disease-free seed tubers had been planted. In these cases, a higher soil inoculum level was measured. No correlation was found between seed potato infection and the disease level at harvest.

For silver scurf, no soil inoculum for any soil sample from the 50 potato fields was detected with qPCR. In contrast, visual control and qPCR analysis showed that the seed lots of all fields in 2016 and 2017 were infested. No correlation was observed between the seed infestation level and the disease level of progeny tubers at harvest. Higher disease levels at harvest for silver scurf were found in fields with low and high disease levels on the seed tubers.

Disease development for the two diseases was clearly different from harvest to shop shelf. Potato lots with low disease severity for black dot at the beginning of storage stayed clean during storage and after packaging. The average disease severity (%) of all 25 lots increased from 6.6% to 8.9%. In contrast, average disease severity for silver scurf increased significantly in the same period from 1.3% to 7.4%. For silver scurf, important increases were also observed on potato lots which were visually almost free of silver scurf at the beginning of storage. Silver scurf disease severity also increased after washing and packaging in plastic bags. The risk of a serious reduction in tuber quality from harvest to shop shelf seems to be higher for silver scurf than for black dot.

The preliminary results show a diverging development of the two diseases. The analysis of the data over all three years from 2016 to 2018 will allow the infection-risk periods in the various stages to be determined and hence the optimal time period to control these diseases by integrated pest management to be identified.

Keywords: disease management, *Helminthosporium solani*, *Colletotrichum coccodes*

PS-3.2-02

Main Crop - Subsidiary Crop - Weed Interactions in an Intercropped Cropping Sequence under Organic Managemnet

Elsa Lagerquist[1], Alexander Menegat[1], Christine Watson[2], David Parsons[1], Göran Bergkvist[1]

[1]Swedish University of Agricultural Sciences, Sweden, [2]Scotland's Rural College, Sweden

Abstract:

Introduction: Healthy soils, no pollution and recycling of nutrients are core aspects of organic farming. However, there are still challenges to be addressed, such as nutrient management and yield levels. Furthermore, organic systems rely largely on soil tillage to control weeds, which can have a negative impact on soil fertility and the environment, as well as preventing the production of ecosystem services. Subsidiary crops (SCs) could provide ecosystem services such as biomass production, reducing soil erosion and competing with weeds. The aim of the project is to optimize the crop sequence *spring cereal – winter cereal* with regard to the ecosystem services yield, nitrogen circulation and weed control, through intercropping with legumes and strategic row hoeing. The focus of this presentation is the effect of SC mixtures and row hoeing intensity on the biomass composition of the three vegetative components at the harvest of the spring cereal.

Method: Experiments are carried out at two locations, here called OG (58°26'42.2»N 15°18'50.1»E) and SK (55°41'03.0»N 13°13'34.9»E) in southern Sweden starting in 2017 and 2018. The experiments have two factors, placement of SCs, and legume species mixture. The species mixtures are *Trifolium resupinatum* and *T. squarrosum*; *T. incarnatum* and *Vicia villosa*; and *T. arvensis*, *T. repens* and *Medicago lupulina*; The SCs are sown into oats, either at the same time, in the oat row, or one month after, between oat rows. Weeds are control by row-hoeing, with two different intensities, depending on the placement of SCs. After harvest of oats the SCs are left and winter wheat is sown between the rows of the SCs. Data on biomass of oats and legumes is collected at tillering, anthesis and maturity of oats. At maturity total weed biomass is also collected.

Results and discussion: At the SK site yield of oat was significantly lower in treatments with SCs, while at the OG site only treatments with *T. incarnatum* and *V. villosa* sown in conjunction with the sowing of oats reduced yield significantly. Species of annual SCs produced about five times more biomass when sown in conjunction with the sowing of oats, while species of perennial SCs produced the same amount of biomass at both sowing dates. Weed biomass was significantly reduced by the first row hoeing, compared to weed biomass in the oat rows. There were no differences in weed biomass between treatments with one or two row-hoeing events.

Conclusion: The effect of SCs on oat yield differed between sites. Differences in the amount of rain is one possible reason, as it affects the competitiveness of the SCs. The data on biomass production indicate that different SC mixtures are suitable for different placement. Finally, weeds could be satisfactory controlled by row hoeing.

Keywords: Intercropping, subsidiary crops, Avena sativa, legumes, weeds