

PROCEEDINGS

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Using New Methods to Phenotype Tan Spot of Wheat: a Collaborative Project between Aberystwyth University, in the UK, and Embrapa Trigo, in Brazil

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Tan spot, a disease caused by *Pyrenophora tritici-repentis* is one of the most important disease of wheat, which can cause up to 80% of loss in susceptible cultivars. In Brazil the disease is considered to be related to the no tillage system that is used in the whole country as conservationist agriculture. The stubble and straw left behind after each season work as source of inoculum for the pathogen. In the United Kingdom, since the last 10 years the incidence of the disease is becoming higher than the past and the researchers are concerned about the future, considering the possibility of global warming, which can create a favorable environment for the disease spread. At the beginning of 2015, a team of researchers from the Aberystwyth University (AU) and from Embrapa Trigo (ET) started a collaborative proposal that aimed to create a strong research group, for develop projects in both countries. The first project built combines 'omics technologies and modelling, which have as the main objectives: 1) developing novel early-detection algorithms to detect plant infection before plant actually exhibits the clear signs of diseases and 2) identify gene markers associated to Tan Spot resistance in wheat. The whole project is split in two stages. During the first year of the project researchers from ET - Passo Fundo, Embrapa Instrumentação Agropecuaria (EIA) - São Carlos, AU-Aberystwyth and National Institute Agricultural Botany (NIAB) - Cambridge had several meetings, in order to discuss and plan a full proposal that was applied last September in both countries. One trial was conducted at ET that aimed to identify contrasting wheat parents for resistance to tan spot. Another trial was conducted at AU, which aimed to identify and test some methodologies to detect non-visual symptoms at wheat inoculated with the pathogen. At the trial in Passo Fundo it was identified two parents that were already crossed to develop a segregating population for resistance to tan spot of wheat. For the trial in the UK eight genotypes of wheat were inoculated with *Septoria tritici*, an alternative pathogen, instead of *P. tritici-repentis*, that shows similar symptoms on wheat cultivars. Measurements of the leaf reflectance and transmittance were performed, at the 4th, 8th and 11th day after inoculation (DAI), using a handheld spectrometer for UV-VIS (Ocean Optics). One genotype showed a faint shift of reflectance, between the inoculated and the non-inoculated, among the measures, from the first one to the last one. All measures of reflectance were done before the visual symptoms. At the 11th DAI the reflectance of the inoculated leaves was higher than the non-inoculated, at the Near Infra-Red spectrum. From the same plants it was taken pictures using a RGB camera with two filters – 900 nm and 970 nm (into the NIR), in order to try to see this difference. The data from RGB is still under analysis.