

The susceptibility of grain sorghum (*Sorghum bicolor*) to infection and colonisation by *Fusarium pseudograminearum* (Fpg) and *Gibberella zeae* (Gz) was assessed by isolation studies involving plants grown in field plots and commercial fields. Fpg was isolated at low frequency from plants sampled from an experimental trial site at Livingston Farm, Moree which harboured varying levels of stubble-borne inoculum. In this trial site 1000 plants were analysed at pre- and post-senescence from four replicate plots in each of five residue management treatments. Fpg was detected at insignificant levels in sorghum from the different treatments and inoculum levels. No Gz was isolated from this trial site. The effect of agro-climate factors on the occurrence of Fpg and Gz in mature sorghum stems was assessed at 31 commercial sites representing two climatic regions, Goondiwindi/Moree and the Liverpool Plains. Fpg was rarely isolated from the commercial crops, which provides further evidence that modern hybrids are resistant to infection and colonization. In contrast, Gz was isolated at low to medium levels from the Liverpool Plains region where the pathogen is relatively common, causing *Fusarium* head blight of wheat, in some seasons. However, Gz was not isolated from sorghum stalks from Goondiwindi/Moree region. In addition, Gz was more frequently isolated from sorghum crops where the wheat residues were known to be infested with Gz.

**37.112 PSEUDOMONAS SYRINGAE AVR<sub>B</sub> SUPPRESSES DEFENSE RESPONSES IN SUSCEPTIBLE SOYBEAN.** O. Radwan, J. Zou and S.J. Clough. 1101 W. Peabody Dr., Urbana, IL 61801 USA. Email: oradwan@uiuc.edu

Bacterial effector proteins secreted through type III secretion systems play a crucial role in establishing plant and human diseases. Type III effectors have been shown to trigger defense responses when recognized by resistant plants, and to suppress defense responses in susceptible host plants. Here we examined the hypothesis that *Pseudomonas syringae* pv. *glyciniae* (*Psg*) carrying the avirulence gene *avrB* suppresses soybean defense responses from a soybean host that lacks the corresponding *R* gene (*RPG1*). We inoculated *rpg1* recessive soybean plants with *Psg* with or without *avrB*, and compared gene expression profiles to expression response from soybean dominant for *RPG1*. Gene expression profiling using soybean oligo microarrays consisting of approximately 38,000 different genes, indicated that while defense genes, transcription factors, genes involved in the phenylpropanoid pathway and signal transduction components were up-regulated in the *Psg* incompatible reaction, they are down in abundance when comparing *rpg1* susceptible plants inoculated with *Psg* (*avrB*) compared to an *Psg* (*avrB*) control. The expression profiling results support the hypothesis that avirulence genes have a 'dual agent' character and can trigger rapid defense in incompatible interactions, and can promote bacterial multiplication by suppressing plant defenses and enhancing access to nutrients trapped in plant cells in susceptible interactions.

**37.113 RNA-DEPENDENT RNA POLYMERASE-1 CAN PLAY A DEFENSIVE ROLE IN SYSTEMIC VIRAL INFECTION.** E. Rakhshandehroo, J. Squire and P. Palukaitis. Department of Plant Pathology, College of Agriculture and Natural Resources, Science and Research Branch, Islamic Azad University, Tehran 14515-775, Iran, Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA, UK. Email: rakhshandehroo\_fa@srbiau.ac.ir

RNA-dependent RNA polymerases are amongst the most con-

served enzymes within eukaryotic cells. The aim of this study was to evaluate the role of the tobacco (*Nicotiana tabacum* cv Samsun NN) RdRp-1 in response to infection by Potato virus Y strain O. We used two lines of transgenic tobacco in which the RdRp-1 gene was silenced moderately (R-14-1) or highly (R-5-1). Examination of the expression level of RdRp-1 by semi-quantitative RT-PCR indicated a higher level of gene expression after infection with PVY in all inoculated plants compared with the uninoculated control plants. After inoculation with PVY, the RdRp-1 gene was expressed to a higher level in the non-transgenic plants than in the RdRp-1-silenced lines; however, PVY infection could also induce the expression of the RdRp-1 gene in both RdRp-1-silenced transgenic lines, although to a lesser extent than in the non-transgenic plants. Analysis of the plants using Western blotting for PVY coat protein and semi-quantitative RT-PCR for PVY RNA, showed a lower level of virus accumulation in non-transgenic plants after inoculation with PVY in comparison to both RdRp-1-silenced transgenic lines. We also found a higher level of expression of the gene encoding the so-called inhibitor of virus replication in non-transgenic plants than in either of the two transgenic lines after PVY infection. Therefore, our data indicate that the RdRp-1 enzyme is involved in the expression of host resistance responses to viral infection even during a compatible virus-host interaction leading to systemic infection by PVY in tobacco plants.

**37.114 THE INFLUENCE OF SILICON ON COMPONENTS OF RESISTANCE TO ANTHRACNOSE IN SUSCEPTIBLE AND RESISTANT SORGHUM LINES.** R.S. Resende, F.Á. Rodrigues, J.M. Soares and C.R. Casela. Viçosa Federal University, Department of Plant Pathology, Laboratory of Host-Parasite Interaction, Viçosa, MG, 36570-000, Brazil. Email: fabricio@ufv.br

This study aimed to evaluate the effects of silicon (Si) on some components of resistance to anthracnose (*Colletotrichum sublineolum*) on sorghum. A 5x2 factorial experiment, consisting of five Si rates (0, 0.06, 0.12, 0.24 and 0.30 g/kg of soil) and two sorghum lines ('BR009'; susceptible; 'BR005'; resistant) was arranged in a randomized design with three replications. Plants from both lines were inoculated 30 days after emergence. The incubation period (IP), latent period (LP<sub>60</sub>), relative infection efficiency (RIE), area under anthracnose progress curve (AUAPC), real disease severity (RDS) estimated with the software QUANT and final disease severity (FDS) were evaluated. A positive quadratic regression model best described the effect of Si rates on both PI and LP<sub>60</sub> for the susceptible line. For the susceptible line, the variables RIE, AUAPC, RDS and FDS decreased as the Si rates increased with the lowest values occurring at 0.25 g of Si/kg of soil. The LP<sub>60</sub> for the resistant line was unaffected (absence of acervulae) by the Si rates. The IP for the resistant line was not affected by the Si rates. Si rates had a significant effect on AUAPC, RDS and FDS for the resistant line. Si content in sorghum tissue increased relative to the control by 55 and 58%, respectively, for the susceptible and resistant lines. There was no significant change in calcium in sorghum tissue for either line tested. In conclusion, the results underscore the importance of Si in resistance to sorghum anthracnose particularly for the susceptible line. Financial Support: FAPEMIG.

**37.115 HOST RESPONSES TO INFECTION BY SOUTH AFRICAN CASSAVA MOSAIC VIRUS.** M.E.C. Rey and E.J. Pierce. School of Molecular and Cell Biology, University of the Witwatersrand, Johannesburg, South Africa. Email: chrissie.rey@wits.ac.za