

SOYBEAN RUST: A new disease on the move

by

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ABSTRACT

Phakopsora pachyrhizi H. & P. Sydow, the causal agent of soybean rust was first reported in 1902 in Japan. The pathogen has subsequently spread from the eastern countries to Australia, India, Hawaii, Africa and South America. The US is currently the only major soybean production area where the pathogen has not yet been reported. It is believed that the pathogen will arrive there shortly. *Phakopsora pachyrhizi* is a fungus which has the potential to cause excessive crop losses. Yield losses of 10 - 80% have been reported in South Africa. Two species of this disease have been identified, *P. pachyrhizi* and *P. meibomia* (Arthur) Arthur. *Phakopsora pachyrhizi* is more aggressive and causes significant yield losses. Classical and real-time fluorescent PCR assays are used to differentiate between the two species. Uredospores are commonly found in nature, whereas teliospores are rarely ever observed. The host range is wide, with infection of 95 species among more than 42 genera in the bean family Fabaceae. Common symptoms include reddish-brown or tan lesions on the abaxial and more rarely the adaxial leaf surface. Once lesions occur, defoliation is rapid, resulting in fewer pods and seeds, lower seed weight and early maturity. Spores are dispersed by air currents. The pathogen is able to directly penetrate the host through the leaf cuticle and epidermis, and does not have to find stomata as do other pathogens. Optimum conditions include average temperatures between 15-28°C, relative humidities of 75-80% and long periods of leaf wetness (6-12hrs). Control methods include application of fungicides (from the triazole and strobilurin groups), cultural control methods, resistant varieties and biological control. Currently in South Africa a National Rust Task Team, which includes the Department of Agricultural and Environmental Affairs, Protein Research Trust, Agricultural Research Council, seed and chemical companies and several universities was formed to find solutions to this important and devastating exotic disease.