SOYBEAN RUST: RISK ANALYSIS, LOSS ASSESSMENT AND QUANTIFICATION OF THE EPIDEMIOLOGICAL VALUE OF INTERVENTION TECHNOLOGIES (M141/60)

Prof NW Mc Laren, Department of Plant Sciences, University of the Free State, P O Box 339, Bloemfontein, 9300. Formerly ARC-Grain Crops Institute, Private Bag X1251, Potchefstroom, 2520.

Abstract

Soybean rust was first recorded in South Africa in February 2001 in the Vryheid area from where it spread to most production areas east of the escarpment. Initial management of the disease was based on fungicide spray programmes. In this study, trials were conducted at Cedara during 2003/04 and 2004/05 to determine the susceptibility of commercial soybean cultivars in South Africa to soybean rust and to quantify the role that these may play in disease control. Field trials consisted of 30 entries replicated three times. Each plot consisted of 4 rows, 8m in length and spaced 45 cm apart. A population density of 360 plants ha^{-1} was used. Planting of replicates was spaced from mid-November to late-December during each season. Ratings were conducted at weekly or two-weekly intervals and expressed as affected leaf area based on rust severity and the degree of defoliation. Onset of disease, expressed as relative life-time differed significantly with cultivar, with the greatest delay in LS678. AUDPC was significantly related to onset with concomitant differences between cultivars. Yield loss across cultivars was poorly related to AUDPC values (R^2 = 0.06 and R^2 =0.11 during 2003/04 and 2004/05, respectively). Yield losses were related to maturity group, with lower losses in shorter season varieties than longer season varieties. Reduced losses were, however not sufficient to be of economic value and none of the cultivars showed significant tolerance levels.