Angular leaf spot and monthly rainfall impacts on yield of Brazilian common bean cultivars

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Abstract

Conducive weather favouring angular leaf spot (ALS = *Pseudocercospora griseola* (Sacc.) Crous & Braun) epidemics is present at all Brazilian regions where common beans (*Phaseolus vulgaris* L.) are grown. In contrast, there is no broad-scale estimate of ALS impacts on crop yield, neither models concerning weather variables and disease severity. Consequently, the objective of this study was to estimate yield losses caused by ALS of common bean, and the impacts of monthly rainfall on disease and yield. Field trials with the susceptible cultivars BRS Grafite and BRS Requinte were carried out on both rainy (Oct-Jan) and dry season (Feb-Apr) in 15 cities from seven Brazilian states, during 2007 and 2008, according to the same technical recommendations, without fungicides. Disease assessments in the pod-filling stage followed a 1-9 scale, and yield was estimated after seed moisture was adjusted to 15%. Monthly rainfall was retrieved from National Water Agency weather stations close to each experimental field, and paired to disease severity and yield. Results were submitted to analysis with SAS 9.1 GLM, MIXED and REG procedures. Yield losses were higher at the dry season but did not differ between cultivars, regardless of the crop location. Yield and ALS severity were inversely proportional. Common bean yield was proportional to rainfall amount on the crop's first 30 days, but an inverse relationship was found for the second and third months. These results will support studies about regional-scale impacts of disease, and a weather-based forecast model to predict ALS on common bean crops.