Differentiating the Epidemics of Early and Late Leaf Spot to Determine Implications for Prescription Fungicide Programs.

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Development of Peanut Rx has allowed growers in the southeastern U.S. to reduce fungicide inputs in reduced-risk situations without sacrificing yield. An assumption from Peanut Rx is that prescription programs are equally effective in management of early leaf spot (Cercospora arachidicola) and late leaf spot (Cercosporidium personatum). This is mainly due to the non-differentiating nature of the Florida 1-10 scale for assessing severity of leaf spot in peanut. Key objectives of this study were to differentiate the epidemics of each disease and to further validate the efficacy of Peanut Rx by comparing prescription programs to two weather-based systems across two different peanut market types. Studies were conducted at the Attapulgus Research and Education Center (AREC), and the Coastal Plain Experiment Station which included both the Black Shank farm (BSF) and Tifton Vegetable Park (TVP). Plots were planted in May of 2011 to both a runner and Valencia market type (‘Georgia-06G’ and ‘Georgia Valencia’ or ‘New Mexico Valencia’, respectively), and managed and irrigated according to Extension recommendations. For the Valencia market type, sites were determined to be moderate, high and moderate risk to leaf spot, respectively; whereas, for the runner market type, sites were determined to be moderate, high and low risk to leaf spot, respectively. Included in the study were azoxystrobin, tebuconazole, propiconazole, chlorothalonil, and flutolanil at rates and timings appropriate for high, moderate, and low risk programs and for two weather-based advisories. Data collection began in mid-July 2011 and five stems were destructively sampled from the inner canopy of each plot on a bi-weekly basis. The proportion of C. arachidicola to C. personatum was documented at each location by summing the number of lesions attributable to either early leaf spot or late leaf spot over the season. Effects of fungicide programs and market types on each disease were evaluated by measuring percent defoliation and yield. Area under the disease progress curves (AUDPC) were standardized (stAUDPC) by dividing by the total length of each assessment period in order to compare the epidemics by market type. At AREC and BSF, epidemics of early leaf spot were established by mid-July; initial detection of late leaf spot occurred in late August or in September at all locations. Early leaf spot was predominant at AREC and BSF; late leaf spot was predominant at TVP. Where early leaf spot was predominant, Valencia cultivars had greater than or equal the defoliation of Georgia-06G; however, where late
leaf spot was predominant, Georgia-06G had significantly higher levels of defoliation. At all locations, stAUDPC values of percent defoliation were typically significantly lower in treated plots compared to the untreated control. However, stAUDPC values were not statistically lower in plots treated 7 times with fungicides than in plots treated fewer times based upon reduced input programs. For both market types, yields at AREC were significantly greater in treated plots than untreated plots, and reduced input programs often yielded numerically better than the 7 spray programs. Yields at TVP were often numerically greater in treated plots versus untreated plots. Results from this study indicate that both early and late leaf spot are effectively controlled with prescription programs across both market types.