

Impact of El Niño Southern Oscillation (ENSO) on *Tomato Spotted Wilt Virus* Risk Levels for Peanut

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Significant economic losses have been recorded by peanut growers since spotted wilt was first observed in the southeastern United States in 1986. Spotted wilt is caused by the *Tomato Spotted Wilt Virus* (TSWV) which is transmitted by thrips vectors including western flower thrips *Frankliniella occidentalis*, and tobacco thrips, *Frankliniella fusca*. The severity of the disease in peanut fields is extremely variable, perhaps due to climate variability and the sensitivity of the thrips-vector populations to changing weather conditions, which impacts their development and reproduction. The goal of this study is to improve spotted wilt disease management in peanut through a better understanding of how climate variability affects TSWV. The specific objective was to examine the impact of El Niño Southern Oscillation (ENSO) on the TSWV risk levels of peanut. Our analysis was based on multi-year on-farm disease survey observations that were conducted in peanut fields in 1998, 1999, 2002, 2004 and 2005. Spotted wilt percent severity that was recorded during the field surveys was classified into three risk categories, e.g., low, moderate and high. The growing seasons were classified into El Niño, Neutral or La Niña based on the Climate Prediction Center's (NOAA-CPC) definition of ENSO. The results showed that the spotted wilt severity was significantly lower during La Niña seasons compared to El Niño or Neutral years. The probability of high risk was approximately 6%, 29% and 32% during La Niña, Neutral and El Niño respectively. Incorporating a climate component into the existing management practices, e.g., *TWSV risk index*, could significantly improve the management decisions of growers against spotted wilt disease in peanut. The TSWV risk index was developed by scientists at the University of Georgia, to assist peanut growers with assessing the risk levels associated with production practices in order to avoid high-risk situations. A decision support tool based on the outcomes of this study will be implemented on AgClimate (<http://www.agclimate.org>) for growers and other stakeholders.

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