

The Economics of Plant Stress Reduction Through Biotechnology: An Application to the Northern Plains Region of Texas

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This study had two overall purposes. The first was the estimation of the economic impacts of precipitation and thermal (heat) stress on crops grown in the Texas High Plains. It was found that these two types of stress have a statewide impact of almost \$470 million per year. That is, technologies attempting to reduce the impacts of these stresses on crop production in the region could have a high payoff. Also, this type of "After-the-Fact" information can be used to formulate and target research programs. For this reason, the second purpose of this study was to estimate the possible impacts of expected advances in crop biotechnology by optimizing the risk/return trade off for representative farms in the region. The results indicate that such advances could increase producers' net revenues and generally decrease the associated production risks faced by producers. Furthermore, it was recommended that development of dryland cotton and grain sorghum varieties should be a priority of biotechnology research efforts in the Texas High Plains.