

**“An Analysis of Climate Impacts on Herbicide, Insecticide and Fungicide Expenditures:  
A Forward Looking Analysis”**

Lauren Rhodes and Bruce A. McCarl

Climate change has the potential to not only alter crop yields through changes in temperature and precipitation, but to also affect pest populations and expenditures on pesticides and other pest treatment methods. To this end, climate change can impact both the total quantity of pesticides and the types and combinations of chemicals applied to crops. This paper analyzes the effect of climate change on the average and variability in expenditures on the three subgroups of pesticides: fungicides, herbicides, and insecticides plus insect resistant crops. This is done by first estimating the effects of climate variables such as total precipitation over the cropping season and mean monthly temperatures plus the incidence of pest resistant crops for the states that grow corn, cotton, soybeans, wheat, and potatoes on total expenditures and their variability by subgroup of pesticides and for resistant crops. We then estimate likely changes in future expenditures, resistant crops and their variability by projecting expenditures and incidence under different IPCC climate change scenarios.