Evaluation of Pesticide Efficacy in Situations where Spray Application is Delayed.

P.M. EURE*, D.L. JORDAN, G.S. CHAHAL, J.S. BACHELER, A.C. YORK, R. SEAGROVES, and J. HINTON, North Carolina State University, Raleigh, NC 27695.

Weather events, equipment failure, and other unforeseen events can prevent the timely application of spray solutions. Although pesticides are often left in the spray tank for numerous days, there is little information available to growers concerning the effects of delayed applications on efficacy. The objective of this research was to determine the influence of delayed spray application on efficacy of pesticides commonly applied to peanut. Research was conducted in North Carolina during 2009 to determine the influence of delayed applications on efficacy of peanut fungicides, herbicides, insecticides, and prohexadione calcium. Treatments included four timings of mixing prior to application: mixing the day of the application (0 day), and mixing 3, 6, and 9 days prior to application. Pesticides were stored in plastic bottles in the dark at room temperature. Pesticide solutions were agitated thoroughly immediately prior to application. Four trials were conducted with the Sclerotinia blight (Sclerotinia minor) fungicides boscalid and fluazinam. Two trials were conducted with fungicides that control early leaf spot (Cercospora arachidicola) and late leaf spot (Cercosporidium personatum) including chlorothalonil, pyraclostrobin, tebuconazole, and prothioconazole plus tebuconazole. One trial was conducted with acephate for early season tobacco thrips (Frankliniella fusca) control. In separate experiments, corn earworm (Heliothis zea) insecticides included fenpropathrin, indoxacarb, and lambda-cyhalothrin, each evaluated in one experiment. Three trials were conducted with the preemergence herbicides diclosulam, dimethenamid, flumioxazin, imazethapyr, pendimethalin, and S-metolachlor. In separate experiments, postemergence herbicides included dicamba, glufosinate, glyphosate, imazethapyr, lactofen, and paraquat. Two trials were conducted with the plant growth regulator prohexadione calcium. Pesticides were applied at the manufacturer’s suggested use rate in municipal water at pH 6.5. Visual estimates of percent weed control, canopy defoliation (caused by early and late leaf spot), plant condition rating (percentage of the canopy expressing disease), damage from thrips feeding, and row visibility were used as indicators of agrichemical efficacy as influenced by the time elapsed between mixing and application. Efficacy of chlorothalonil, pyraclostrobin, tebuconazole, and prothioconazole plus tebuconazole, and boscalid was not affected by delayed spray applications. However, in 1 of 4 trials fluazinam mixed three days prior to application controlled Sclerotinia blight better than the 0, 6, and 9 day mixes. When considering thrips and corn earworm insecticides, delayed application of spray solutions did not affect efficacy of acephate, fenpropathrin, indoxacarb, and lambda-cyhalothrin. Preemergence and postemergence herbicides diclosulam, dimethenamid, flumioxazin, imazethapyr, pendimethalin, and S-metolachlor were not affected by delayed applications. However, efficacy of lactofen and paraquat were affected by delayed applications although differences were sporadic. In the plant growth regulator study, prohexadione calcium efficacy was not influenced by delayed spray applications. While these data suggest that growers should be aware of possible inconsistent pest control with certain pesticides that sit in the spray tank for extended periods of time, additional research is needed to clearly define the scope of this potential issue.