

ADSORPTION AND DEGRADATION OF MESOTRIONE IN FOUR SOILS. Dale Shaner, Galen Brunk, Scott Nissen and Phil Westra, Plant Physiologist, USDA-ARS. Fort Collins, CO 80526, and Research Associate, Professor and Professor, Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, CO 80523

The adsorption and fate of mesotrione was studied in four diverse soil types varying in pH, organic matter (OM), and texture. The adsorption of mesotrione to each soil was determined using a batch equilibrium method. OM and soil pH were the most significant component of mesotrione adsorption. As soil pH increased, mesotrione adsorption decreased. The rate of dissipation of mesotrione in the plant available soil water (PAW) and soil matrix was determined for all four soils. Mesotrione decomposed rapidly in PAW of a soil with high pH (pH 7.4) whereas there was no decomposition in PAW in an acidic soil (pH 5.2). Degradation of mesotrione was significantly reduced or eliminated in PAW when soils were sterilized by irradiation. Overall, the extent of adsorption is dependent on soil OM while degradation is driven by soil microbes. Soil pH also has a major impact on the ultimate fate of mesotrione. Mesotrione degraded rapidly in a low OM, pH 7.4 soil, but was stable in a low OM, pH 5.2 soil. Chemical degradation becomes more significant in high pH soils.