Soybean (*Glycine max*) varieties resistant to dicamba and 2,4-D have been approved for use in the United States. Farmers are expected to use them to improve control of troublesome broadleaf weeds. Repeated use of glyphosate has selected for populations of glyphosate-resistant weeds, including populations of goosegrass (*Eleusine indica*), johnsongrass (*Sorghum halepense*), and ryegrass (*Lolium perenne ssp. multiflorum*). In addition, many soybean fields are infested by volunteer glyphosate-resistant corn. The most likely herbicide that will be used to manage glyphosate-resistant grasses in dicamba or 2,4-D resistant soybean fields is clethodim. However, tank-mixes of clethodim plus dicamba, or clethodim plus 2,4-D, can sometimes result in reduced control of weedy grasses. Our research measured the interactions between 2,4-D or dicamba tank-mixed with clethodim on control of important grass weeds of Midwest in a greenhouse environment. Species include volunteer corn (*Zea mays*), giant foxtail (*Setaria faberi*), yellow foxtail (*Setaria pumila*), green foxtail (*Setaria viridis*), barnyardgrass (*Echinochloa crus-galli*), shattercane (*Sorghum bicolor*), Italian ryegrass (*Lolium multiflorum*), johnsongrass, goosegrass, and large crabgrass (*Digitaria sanguinalis*). Treatments applied included an untreated control, clethodim, 2,4-D, dicamba, clethodim + 2,4-D, and clethodim + dicamba. Plant response was collected approximately 1, 2 and 3-4 weeks after treatment. The study was conducted initially in spring 2015 and repeated in fall 2015. In the spring trial clethodim activity was antagonized when it was tank-mixed with 2,4-D or dicamba on all species except johnsongrass. In the fall trial, clethodim was not antagonized by 2,4-D on any species. Dicamba caused antagonism of clethodim on shattercane and corn. The reason for the inconsistent results between spring and fall trials is not understood.