

Make Sure Products are Compatible When Tank Mixing Spray Partners

When tank mixing two or more pesticides or pesticide-fertilizer combinations, use a “jar test” to determine physical compatibility.

Steven Poindexter, Senior Sugarbeet Extension Educator, MSU Extension
Poindex2@msu.edu; Cell 989-798-5848

Tank mixing two or more pesticides and/or fertilizers is often used to increase effectiveness, save time and cost. However, growers need to be aware of possible legal issues and compatibility concerns. Always “Read and Follow the Label Directions” before combining any products. It is illegal to mix pesticides with other products (such as other pesticides, adjuvants, or carriers) when specified on the label. Because of the large combination of potential tank mix partners the label may not address all possibilities or give you any guidance. When this occurs, it becomes your responsibility to make sure products can be combined without chemical and physical incompatibility.

Chemical compatibility cannot be determined just by mixing the products together in a simple “jar test”. Some products easily mix together but can cause antagonism, resulting in poor performance. Or they may be synergistic with increased efficacy. It is not uncommon when products are mixed together that crop injury can result. The label can be your best source of information of what combinations to avoid. Also consult with experience applicators, crop consultants and/or Michigan State University Extension for advice.

Physical incompatibility occurs when some pesticides, fertilizers and/or adjuvants cannot physically be mixed. This can be caused from improper mixing order, inadequate agitation, or lack of stable emulsifiers in some emulsifiable concentrates (EC’s). Often mixtures will settle out in layers or solids will settle out. One example is if EC’s are added to the tank before wettable powders a putty similar to pancake mix will float on the top and not mix. Sometimes mixtures can curdle, gel or form sludge like material in the tank. Often these materials will cause nozzle plugging or be impossible to spray. Fertilizers mixed with EC type materials often have problems. This type of compatibility can be determined by using a simple “jar test”.

To properly use a jar test you must use proportionate amounts of all the materials you intend to mix in your sprayer in a clear quart jar. For liquid formulations, use a teaspoon measure for each pint/100 gallons of final spray mixture. For dry formulations use a tablespoon for each pound /100 gallons of water. If water is going to be your carrier add one pint to the quart jar. Add pesticides to the water one at a time in the proper mixing order and make sure each is completely dissolved by stirring or agitation. The first additions in order are generally wettable powders, dry flowables, water dispersing granules and flowables first. Then follow with suspended concentrate liquid products, emulsifiable concentrates/solutions and surfactants last. Follow label procedure if stated.

When all products are thoroughly mixed by shaking or stirring, allow it to sit for a length of time (usually 15-45 minutes). Incompatibility is evident if clumps, scum and solids form, or if the mixture heats up. When signs of incompatibility are evident the jar test process can be repeated utilizing a compatibility agent first, which may or may not

help. Always use caution and follow the label completely when tank mixing pesticides and fertilizers.