

# Tank Mixing Herbicides: Important Things To Know

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**T**ank mixing herbicides can reduce the amount and frequency of herbicide application. According to Josie Hugie, graduate student at the University of Illinois, the most important thing to know about tank mixes is how to combine them properly. “You don’t want to tank mix herbicides that are incompatible,” states Hugie, “You also want to make sure that you are not taking away from the efficacy of either product.” Problems with tank mixing include potential interactions that weaken one or both of the substances mixed, differential absorption, adjuvant incompatibility, and order of substance mixing.

The introduction of synergism has increased the productivity of tank mixing. “Synergism is

**Josie Hugie, graduate student at the University of Illinois, explains the most important thing to know about tank mixes is how to combine them properly.**

Photo by John LaRose, Jr.

where you have a higher combined activity than what is expected in a herbicide by mixing two compounds,” states Hugie, “The typical interaction in tank mixes is additivity, which results in the expected amount of activity from both compounds. With synergistic herbicide activity, an interaction of one plus one

equaling greater than two occurs.”

“My particular project covers the synergism of mesotrione and atrazine mixtures or Callisto and atrazine mixtures,” states Hugie. “What we have seen is you have very high synergism at certain rates on broadleaf weeds in the greenhouse and field,” said Hugie. “We are seeing changes in the interactions as the rates change, so it is important to follow the labeled rates particularly when mixing higher rates of mesotrione (Callisto) with about a half a pound to a pound per acre of atrazine,” said Hugie.

“Even target site-based atrazine-resistant plants are showing signs of synergism,” states Hugie, “So it is suggested that atrazine has been reactivated in the resistant plant. Furthermore, if you have resistance in your field, it is important to know what type of resistance that you have.” Hugie states that it is currently unknown if synergism of mesotrione and atrazine will occur in plants with metabolism-

based atrazine resistance.

According to Hugie, you may actually be able to reverse the resistance to herbicides by combining two herbicides with such synergistic mixtures. “We have studied the interaction of mesotrione and atrazine in pigweeds and waterhemp because they are some of the most common problem weeds found in fields today,” said Hugie, “They are also the weeds that are most prevalent to evolving herbicide resistance around the mid-west.”

“The take home message is really this: When you combine herbicides the likelihood of weeds



becoming resistant to two different modes of action is going to be a lot less likely,” said Hugie, “So you are reducing your chances of evolving resistance in fields. Secondly, is that waterhemp, which is resistant to four different types of herbicides in Illinois alone, is becoming a really big problem. Thirdly, tank mixing herbicides with different modes of action is hopefully preventing resistance from becoming a much bigger problem than it already is.”

“Finally, we are not aware of any herbicides with new target sites coming to the market, so we have to do the best we can to maximize what we have,” states Hugie, “Hopefully using synergistic herbicide mixtures like mesotrione and atrazine will help to prevent any more resistance from occurring. If we don’t take action, we are going to end up with out many herbicide options left in crops.”

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