

TANK MIXING: IS YOUR JOB AT RISK?

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The Federal Insecticide, Fungicide, and Rodenticide Act specifies that mixing pesticides with fertilizers does not constitute misuse, when such mixtures are not prohibited by the pesticide labeling. However, you should never assume that pesticides can be mixed together or mixed with a fertilizer unless the combination is specifically indicated on a product label. Successful tank mixing requires extensive knowledge of product formulations, application timing, and application techniques. Incompatibility of two or more compounds can occur. The different types of incompatibility are as follows: physical, chemical, phytotoxic, placement, and timing. Today, I will discuss briefly the first three.

Whether or not two or more compounds are physical compatible should be your first assessment. It should also be your easiest. Signs of physical incompatibility include foaming, gumming, and curdling. Unfortunately, if any of these occur in your spray tank, then you will be dealing with a very messy clean-up that involves a subsequent hazardous waste disposal problem. The easiest way to avoid this is by you performing a "jar test". This procedure is outlined in most chemical application manuals, as well as, many pesticide labels. Such a test attempts to duplicate a desired concentration of product formulations in a much smaller amount of spray solution. To accurately do this you must have access to instruments that can measure much smaller quantities than usual, such as a gram scale and a 10 milliliter graduated cylinder. If you find the same signs listed above in the quart or liter jar, then you have very little clean-up, and you have saved yourself a lot of grief. The physical properties of your water, such as water hardness and pH, can affect physical compatibility.

Chemical incompatibility is not evident in a "jar test," and is therefore much harder for you to assess. This results in reduced effectiveness of your mixture due to an antagonistic relationship between or among the compounds that you are combining. In other words, you probably would have been better off to apply each product separately. Water properties can greatly affect this phenomena, as well.

Phytotoxic incompatibility is usually the most job threatening. Phytotoxic means "life killing". Common symptoms include yellowing, browning, wilting, and perhaps even death, which is an irreversible condition. Things to remember are that (1) products alone may be non-phytotoxic, (2) this occurs more commonly with water soluble pesticides, (3) beware of aromatic solvents found in emulsifiable concentrates (ECs the product), and (4) that phytotoxicity increases often during hot weather. You may avoid catastrophes involving large turfed areas by applying small amounts of any tank mixtures to test areas that are well away from any outside scrutiny. If your "jar test" looks compatible, then you might consider testing it on some turf "out behind the barn" using a small spray bottle. Let several weeks go by before you make the decision to go public with a wide spread application because phytotoxic symptoms may be slow to develop.

Once you have made the decision to apply a full tank mixture, you should have an outlined recipe with everything at hand needed to safely measure and mix the desired products. As always, personal protective equipment is extremely important. You should have a written outline or recipe, and someone to assist and monitor these steps. Combinations occur more rapidly and completely when you dilute most formulations before their addition. This means using a small bowl to make a slurry with wettable powders by mixing the measured product with a small amount of water. With ECs, you may want to mix two parts water to one part desired product before tank addition.

The inclusion of non-required information on a pesticide label is expensive for manufacturers. Some labels contain only general instructions on their labels, and include some of the precautions mentioned above. Others are more specific, and they can even specify what can be mixed and the exact order of addition. On the other hand, tank mixing is not even mentioned on some labels. I have found no instances of a turf pesticide or fertilizer label prohibiting tank mixing.

Dry materials are generally added first. A typical mixing sequence would be (1) wettable powders, (2) water dispersible granules and dry flowables, (3) soluble powders, (4) dry fertilizers, (5) liquid fertilizers, (6) liquid flowables, (7) adjuvants, and (8) ECs. Oftentimes, adjuvants are very specific about when they should be added.

Many "galloping gourmets" use tank mixing as a tremendous tool that has great economic and performance benefits. Less number of applications at less frequency can well save time, labor, and equipment wear. But,....*tank mixing can cost you your job!*