

# GROWERTALKS

## Features

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## Combining Pesticides With Fertilizers

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In these difficult times, growers must pay special attention to the efficiency of their operation. Many growers I work with have had to reduce their staff significantly. It's important to utilize the work force as efficiently as possible in order to stay in business and to even survive. One source of efficiency is the proper use of tank mixes in the spray program. I define a tank mix as a combination of more than one crop protection product or fertilizer in the spray or drench tank at the same time. This article will focus on some of the dos and don'ts of mixing fertilizer nutrients with insecticides and fungicides.

Most plants do absorb foliar applied nutrients through their leaves and to a lesser extent through stems. Foliar fertilizing should be viewed as a supplement, however. The majority of plant nutrients should be applied to the media through granular, slow release, liquid or soluble fertilizers, or a

combination thereof. Spraying and especially drenching can be time-consuming and costly, so the ability to provide supplemental nutrition without having to make an additional application can save both time and money. There are some notable exceptions, but most pesticides on the market can be safely mixed with soluble nutrients.

### Knowing what to mix

The first place to start is the pesticide label. Most nursery pesticide labels reference tank mixing to some degree. Many of them advise trying tank mixes on a small group of plants first, prior to making a broader application, and this is good advice. A few pesticide labels specifically prohibit certain types of tank mixing, but many pesticide labels permit it, though blending pesticides with fertilizers is rarely mentioned. When mixing, it's especially important to measure your application rates carefully. I'm often amazed at growers who weigh very expensive pesticides on a cheap, rusty old scale. Good-quality, accurate balances are available at reasonable prices from scientific supply houses.

There are a few pesticides for which tank mixing nutrients is sometimes not advisable. One is the water mold fungicide Aliette (fosetyl-aluminum). Aliette is a great fungicide, but it's rather acidic. This can cause problems at times with tank mixing metals such as micronutrients. This can be done safely if the pH of the solution is buffered; however, with very few exceptions, I advise my grower clients not to tank mix Aliette with

micronutrients.

A second product that I am reluctant to tank mix is Daconil (chlorothalonil). This is another fine product that has been around for decades, and it continues to be very useful. I know some growers who tank mix Daconil with nutrients, but I have also seen situations where certain tank mixes have caused injury. I prefer to apply Daconil by itself.

#### Dos

A popular nutritional for tank mixing is Epsom salts, or magnesium sulfate. Many soluble fertilizer products on the market don't contain much in the way of calcium, magnesium or sulfur. Calcium is generally provided through the use of limestone in the potting media. Putting Epsom salts in the spray or drench tank at about 2 lbs. per 100 gal. is helpful, especially if your plants are low in magnesium or are growing at a higher-than-desired light level. Some of the coated, slow-release prilled fertilizers don't contain sulfur, so this is an easy, inexpensive and safe way for your plants to get supplemental sulfur in an available form.

Most potting media ingredients contain little if any available phosphorus. Composts are an exception, but most peat, bark, sand and wood chip materials don't contain significant phosphorus. For growers who apply initial, preventative fungicide drenches at potting, adding a soluble, high phosphate starter fertilizer such as 9-45-15 or similar can be helpful in rapid, early development of the root system. Obviously, this technique should be avoided for certain bedding plants prone to stretch with high-phosphate fertilizer regimes. Foliage plants respond especially well to drenches. Make sure your source is low in fluoride when used on sensitive varieties. Adding a little phosphate to the fungicide drench can also help regenerate a root system lost to disease. I have seen phosphorus mixed with numerous fungicides successfully, including Banrot, Clearys 3336, Subdue, Chipco 26019, Medallion and Heritage. Soluble 20-20-20 or 24-8-16 formulations can also be used.

Many of our greenhouse and ornamental varieties can have problems with iron deficiency. This can be aggravated by root problems caused by excessively wet soil, or by media that is overly compacted or has low aeration. Plants such as azaleas, many palms, pentas and dracaenas can suffer from this problem. In my experience, most of the iron chelate products on the market are compatible with fungicides. If you have a chlorotic crop with some root disease problems, you can help solve both the disease and the nutrient disorder by combining chelated iron with a fungicide drench.

Urea, potassium nitrate and magnesium sulfate have been mixed successfully with most of the pesticides in the ornamental market. Foliar nitrogen and potassium are absorbed fairly rapidly by most plants. Plants with softer, thinner leaves tend to absorb foliar nutrients more effectively than plants with thick, leathery leaves, or varieties with a thick, waxy cuticle such as dracaena Janet Craig or cyclamen. Keep your rates on the conservative side. I don't like to have an EC in the spray tank above 2.2 mmhos/cm. That threshold should be even lower for delicate varieties, plugs and plants in bloom. Northern growers often prefer nitrate nitrogen sources as opposed to ammonia or urea to help avoid stretch. There's some evidence indicating that adding urea or potassium nitrate to a micronutrient application can increase trace element absorption in some situations.

In my experience, some of the wettable and soluble powder products seem to mix fine with most nutritionals.

Dry flowables and wettable dispersible granule products also seem to tank mix well. I tend to be more careful about mixing when using liquid pesticides, especially those with petroleum carriers. I'm not saying some of these products can't be tank mixed, but use caution and don't be overly aggressive. As a general rule, it's best not to have more than three or four products of any kind in a tank mix, and that includes nutritionals as well as pesticides.

Insecticides such as Avid, Orthene, Talstar and Distance seem to tank mix quite well. The thiophanate methyl fungicides such as Clearys 3336, Subdue, Medallion and Heritage have also been used successfully with nutritional supplements. It's important to keep your nutrient rates conservative, however. Understand that increasing the application rate won't necessarily increase absorption. I don't like to go over 2 lbs. per 100 gal. when mixing soluble fertilizers with pesticides. You can usually go with a little higher rate when tank mixing for drenches as opposed to sprays. Remember that some pesticides have different rates for spraying as opposed to drenching. Make sure your pesticide application rates are consistent with the label, always.

#### Don'ts

There are certain tank mixes that are best avoided. I don't like to mix nutritionals with growth regulators. B-nine and copper don't seem to get along very well. Aliette mixes well with certain other pesticides, but not with copper or other metals. Don't try to mix hydrated lime or flowable dolomite with fertilizers. This can cause an excessive release of ammonia. Mixing calcium nitrate with phosphorus fertilizers can cause precipitation or "salting out" of calcium phosphate and calcium ammonium phosphate. Mixing calcium with sulfate nutrient sources can create some interference, as well. I've seen some problems with growers tank mixing Daconil with some miticides. I don't like to tank mix dimethoate with anything. As a rule of thumb, it's generally not advisable to mix more than two nutritionals in a tank mix with pesticides. Don't mix copper products with beneficial bacteria, or fungicides with beneficial fungi. Solubor is also rather alkaline, so it's best not to mix it with alkaline-sensitive materials.

#### On the plus side

Nutrients such as urea, potassium nitrate, glucoheptanate chelates and magnesium sulfate can be tank mixed with a broad range of fungicides and insecticides. So can most 20-10-20 and 20-20-20 formulations. Most chelated iron products seem to tank mix well. There isn't a lot of tank mix information in the literature, partly because of the huge number of tank mix combination possibilities. Most growers come up with useful tank mix combinations by trial and error. Chemical manufacturer representatives can be a useful source of information, as can consultants and other growers.

Summing up, read the label once again before doing any tank mixes with pesticides. Be conservative with application rates and the number of materials in the spray tank. Your risk increases if you exceed three or four products in the tank. And always try a new tank mix on a few test plants first to make sure the combination is safe. **GT**

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