

Plant Fertilization Isn't A Mystery

AGRI-VIEWS

by Chuck Otte, Geary County Extension Agent

People need nutrients, plants need nutrients. When we get hungry, we eat food. When plants get hungry they try to find the nutrients they need in the soil. If the nutrients aren't there, the plants go hungry and they reflect that in their growth, or lack thereof. We feed the plants by giving them fertilizer. It isn't really that difficult, but many people make it difficult. Just like with people, plants need proper nutrition. Too little of the right nutrients and the plants don't grow properly. Too much and they can overgrow, grow abnormally or we wind up with nutrients running off the land (farm land or residential yards) and we have water quality issues.

Plants feed through their roots. This is a basic concept that many gardeners and fertilizer companies seem to overlook. Let me repeat that; plants feed through their roots. They take up water AND nutrients through their roots. Leaves are where photosynthesis takes place. Photosynthesis is that miracle of plant biochemistry where things like chlorophyll and sunlight and water and nutrients all come together and actually make energy in the form of carbohydrates. Leaves in many plants do have a limited ability to absorb some nutrients. A limited ability to absorb some nutrients.

There are some fertilizer companies that promote foliar feeding of plants. Mix up the fertilizer in a special sprayer and apply it to the leaves. Let me repeat again that plants are designed to take nutrients up through their roots. Ultimately, plants don't care what their nitrogen source is, they just need to have nitrogen. It doesn't matter what organic or inorganic nitrogen source you apply, the nitrogen (or other nutrients) go through a certain set of chemical reactions to get to the form that the plant will take up and utilize. Nitrogen needs to be in the form of nitrate (NO_3^-) or ammonia (NH_4^+) to be taken up and utilized by the plant. Microorganisms in the soil facilitate this if the nitrogen isn't already in that form.

Some forms of fertilizer will be more quickly utilized by the plant. Other forms, especially organic forms from manure or organic matter, must go through many biochemical processes to get down to the base forms that the plant needs. I always like to evaluate fertilizer based on cost. I can go to an ag fertilizer supplier, buy urea, 46% nitrogen, for less than \$20 for a 50 pound bag. Doing the math, that comes out to be about 77 cents per pound of nitrogen. Or, I can get a brand name water soluble fertilizer that is 24% nitrogen and a 1.5 pound box costs around \$7. That comes up to over \$19 per pound of nitrogen. Ultimately, the plant doesn't care which source it comes from!

Both fertilizers are equally effective. Most states require that fertilizers be analyzed in a standard way so that we can compare apples to apples. Both of the above mentioned fertilizers will create good green growth. The nitrogen in both sources will have to get to the same nitrate or ammonia forms before being taken up by the plants. Ultimately, whether it's in a field, in your yard or in your garden, you need to find the fertilizer that works best for you, and then put it on or in the soil, but not on the leaves!

Plants need a lot of nitrogen, phosphorus and potassium and a little bit of many other nutrients. The big thing we need to add to most soils in our area is nitrogen and phosphorus. Deficiencies of any of the nutrients can cause serious plant growth and plant health issues. Soil testing can help determine if there are possible nutrient deficiencies. But when fertilizers need to be applied, make sure you are using the most economical product to get the job done, and make sure it's put on at ground level, so the roots can do their job!