Liebig’s Law

Liebig law of the minimum is a principle developed in agricultural science in 1840 that applies to many of our current management approaches. It states that growth is dictated not by total resources available, but by the scarcest resource or what’s known as a limiting factor.

How does it apply? Any time we look at either a production issue – whether something isn’t growing as well as it should or we’d like to determine how to grow it better – looking at this principle can be of value.

In many of our cool season grass systems, for example, phosphorous is a limiting nutrient (according to soil test results). This principle simply means that we can apply lots of nitrogen, but may not get the desired rate of response if phosphorous levels are limited for some reason.

We see some of the same effect in nitrogen uptake levels when applying sulfur in corn production. Preliminary results of a study at the Kansas River Valley Experiment Field at Rossville showed increases in N uptake when sulfur was applied, likely linked to the balance of nitrogen and sulfur within the plant. In that study, the highest sulfur application rate significantly increasing yield when compared to applications of urea alone (results can be found online at https://newprairiepress.org/kaesrr/vol6/iss9/10/).

Sometimes, the issue isn’t a nutrient, and the production question doesn’t relate to field crops – but it doesn’t matter. The principles of Liebig’s Law can still apply, and that means exploring multiple factors when grass, field, or fruit and vegetable crops don’t perform up to expectation.

To be fair, it can be almost impossible to flush out the scarcest resource in many cases. Fact is, there may even be multiple resources that are scarce. There can even be resource scarcity that we can’t manage. Sunlight or in some cases moisture are both examples.

Next time something isn’t growing as well as you’d hoped, start noting all the resources that go in to getting that plant to survive, let alone thrive. It likely won’t be difficult to see the principle of Liebig’s Law at work.