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The Effect of Soil Fertility on Weed Density

It stands to reason that a higher density of desirable forages in cool season grass stands equals a lower density of undesirable weeds/brush. We maintain good densities via a combination of fertility and harvest management techniques, but it can admittedly be difficult to see if we're really making much change. A University of Missouri study sheds a little light on just how some of those management techniques really do affect weed density.

The study consisted of a pasture survey conducted bi-monthly through the growing season with each survey site within a pasture evaluated for weed infestation and soil fertility levels. The goal was to see what weeds were present and how fertility levels may be contributing to said presence. Soil tests confirmed low Phosphorous (P) levels at 80 percent of the sites and 37 percent with low Potassium (K) levels. Average pH was 5.8.

Fertility speaking, the results were kind of what we'd expect: better fertility equaled less weeds. For P and K, even a slight increase in soil test level reduced weed pressure with P often affecting weed density to a greater degree than K. Soil pH was the best predictor of weed pressure with a one unit increase in soil pH reducing weed density by 4000 weeds per acre.

Not all weeds/brush responded the same, with some *increasing* in response to higher fertility similarly to our desired grasses. As a rule, however, fertility management – pH in particular - in stands with below optimum nutrient levels helped reduce weed densities.

Just as fertility plays a role in the increased ground cover needed to keep weed densities lower, harvest management was confirmed as a factor as well. It showed an increase in ground cover of just one percent could reduce weed pressure by 35 weeds per acre. That 35 weeds per acre may *seem* insignificant, until you consider a plant like hemp dogbane which can produce anywhere from 800 to 12,000 seeds per plant.

If fertilizer prices have you reconsidering fertilizer application rates, proceed with caution. This study confirms numerically what we often see with the naked eye: low fertility stands are weedier. With some stand biomass levels already thinned by fall armyworm feeding, cutting fertility *could* compound the problem even further.