Capitol Region Agronomy Team Report

SOIL POTASSIUM MANAGEMENT FOR DRY COW FORAGES

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According to News and Views from the Potash and Phosphate Institute (August 1995), dairy nutritionists recognize that a transition diet of pregnant dry cows three to six weeks prior to calving is crucial to avoid milk fever and subclinical hypocalcemia.

The optimum dietary cation-anion difference (DCAD) for dry cows is different than for lactating cows. Potassium (K) plays a major role in the DCAD. Over the past 15 years, concentrations of forage K have been increasing.

K concentrations in haylages are considerably higher than those in hay. This is because K is more likely to be lost to leaching by rain from hay than from haylage. Also, the fermentation process involves loss of dry matter without the loss of K. Corn silage has far less K than hay or haylage.

Optimum levels of soil K are essential of persistence of legumes and ensuring optimum yields of both grass and legume forages. Most forages produced with optimum K fertility will not contain excessive K for a lactating cow diet, but there could be a problem when used for the dry cow diet. Produce separate forage for the dry cow. Achieve this by withholding K fertilization even though this may hold yields below 80 percent of those with non-limiting levels of K.

It is important to know the level of soil K in each forage production field. Fields testing lowest in soil K can be set aside for producing forage for dry cows during the transition phase. A regular soil-testing program, with sampling every two to three years, is essential.

Low K forage can be produced on five to 10 percent of total forage acreage. Produce the low K forage on small acreage with a below optimum soil test for K.

Avoid all forms of K fertilization, including manure. Over time, since forage removal of K is high, the soil test level will decline to the point where economic production of forage without replacement of K is not possible. At that point, application of controlled amounts of K fertilizer could resume. Research is needed to determine the precise recommendation of applied K to produce forages of a desired K level.

The concentration of K in plant tissue declines as the plant matures. Therefore, a dry cow forage grass should not be cut early. Weathering, particularly rain on hay during drying may reduce the amount of K in forage. Since K in plant tissue is in a soluble form, it could easily be leached from drying hay by rain. Hay is less likely to have high K than silage.

When soil K levels are high, higher rates of nitrogen fertilizer will increase forage K concentration. Phosphorus fertility is important to ensure optimal plant uptake of magnesium and calcium, cations important in the prevention of milk fever.