

# Fertilizing Alfalfa Following First Cutting

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**A**lfalfa first cutting is not far off, so start thinking about fertilizing alfalfa right after first harvest in order to maximize yield for the remainder of the season. This is the ideal time since it enhances rapid regrowth for subsequent cuttings.

The most important nutrients for alfalfa are phosphorus (P) and potassium (K). Phosphorus is required for root development, stand establishment, and growth, especially early in the season when soils are cold. Potassium has an important role in water-use efficiency, nitrogen fixation, photosynthesis, translocation of carbohydrates to roots, and winterhardiness. Alfalfa removes both elements at relatively high rates compared to other nutrients. One ton of alfalfa removes ~15 lbs P and 60 lbs K. For example, a seasonal alfalfa yield of 5 tons/ac will remove 75 lbs P/ac and 300 lbs K/ac.

In early spring, P and K are released from organic sources and are usually available in sufficient amounts to support alfalfa growth until first cutting. After first cutting, release of soil P and K slow, so supplemental fertilization with both nutrients is required to sustain alfalfa growth for subsequent cuttings. Additionally, an application of K is recommended in early September after the third cutting to improve winterhardiness.

In most soils P and K do not move vertically, so when applied by broadcasting, most nutrients stay in the top 2" of soil. Generally, this is not a problem since ~70% of the fine roots active in nutrient uptake are also in the top 2" of soil.

How much fertilizer should you apply? Soil testing is the best way to determine this. Recommendations vary among states depending on soil types, texture, and pH. If more fertilizer is applied than what plants can utilize, there will be an increased risk of nutrient run-off into surface waters or K leaching in sandy soils.

In addition, alfalfa plants take up more K than needed – known as “luxury consumption” – resulting in elevated K concentration leading to animal health problems. Concentrations >3% can cause milk fever and other problems, especially in lactating cows. Reduce K levels by: reducing stubble height (lower plant parts have lower K concentration); waiting until early bloom to harvest (alfalfa in vegetative/bud stages have higher K than in bloom stage); drying alfalfa in a windrow (rain on windrows decreases K concentration); and mixing alfalfa with grasses (grasses have less K).

Excess P and K cause shoots to grow taller and thicker, reducing alfalfa leaf-to-stem ratio, and decreasing forage nutritive value. Stems are less digestible and have lower crude protein (CP) concentration than leaves. Studies show CP and digestibility are slightly higher in fields with low P and K, although increased forage yield by fertilizing with them more than offsets slight decreases in forage nutritive value.

Other considerations when fertilizing after first cutting include: avoiding fertilizer applications on wet foliage or soils, as this can cause crown damage, and splitting applications to avoid salt damage if >500 lbs of fertilizer will be applied.