High Altitude Meadows in Colorado: III.
The Effect of Nitrogen Fertilization on Crude Protein Production

Forrest M. Willhite, Hayden K. Rouse, and David E. Miller

A large proportion of hay from high altitude meadows is produced without nitrogen fertilization and harvested at late stages of maturity. As a result, the hay may contain low percentages of crude protein. The production of beef, especially from the standpoint of a cow-calf set-up, which is common in the high altitude meadow areas of Colorado, is closely related to crude protein production. In these areas, where winter feeding is essential for up to 180 days, it is usually necessary to feed protein supplement with the low protein hay in order to maintain a good breeding herd and have a satisfactory calf crop. Many ranchers supplement the hay ration with from 0.2 to 0.8 pounds of crude protein per day for each animal.

This paper reports the results of an experiment on a high altitude meadow in Colorado to determine if the need for large amounts of protein supplement could be partially eliminated through increasing protein production on the ranch by application of high rates of nitrogen fertilizer. Since grasses constitute a major part of the forage in the high regions and generally respond well to nitrogen, it seemed reasonable to assume that the meadows would show large responses to high rates of nitrogen.

The literature on effects of high nitrogen levels grown at high elevations and short growing seasons is limited. On the other hand, much work has been done on grasses grown at low elevations, where growing seasons are much longer. Burton and DeVane give an excellent review of the literature on this subject.