Management & Alternative Forages Following a Drought

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In 2021, North and South Dakota and western Minnesota experienced one of the hottest and driest summers on record. Most perennial pastures had some spring growth, but after grazing or cutting, they did not grow back until September. Alfalfa farmers were able to get only one cut, instead of the typical three. The widespread drought caused a scarcity of hay and feed which has driven prices of hay up to four times higher than average. Many farmers had to liquidate herds since they could not afford to feed them. Others were driving >250 miles to buy hay at a very high cost.

Forage sorghum and forage pearl millet grown in Fargo and Hickson, ND, in 2021; rainfall deficit of ~50%, June to the end of August. Sorghum was 8-11' tall. *Photos: September 17, 2021.*

For most drought-stricken areas, rain finally came the end of August, allowing some farmers one more cut of alfalfa in early to mid-October and allowing cattle to graze, alleviating, in part, feed scarcity. Fall rain and snow cover are key to spring soil moisture, which will be used by plants to resume growth after the snow melts.

Unfortunately, we do not have a crystal ball to predict the weather next year. However, increasing forage diversification can better prepare you if drought reappears next season. Planting different crop species, with different crop cycles and composition, ensures continuous forage availability.

In addition to diversity, managing your existing forages to optimize production is also key to increasing your feed supply and availability. Some recommendations:

- Assess the perennial forage or pasture acres you already have and estimate productivity according to the plant stand in a normal-rainfall year and in a year with 50% of normal rain. Estimating a variety of potential scenarios allows you to prepare if there is a rainfall deficit.
- Manage your existing alfalfa acres in order to maximize yield. Take soil samples in existing fields or in those you are planning to establish alfalfa in next spring. If soils are not frozen yet, take a sample now; otherwise, take it in the spring. Why is this so important? Phosphorus (P) is a key element in energy production in the plant cell, allowing rapid growth as soon as the plant breaks dormancy. In early spring, soils are cold and wet and a P deficiency will slow growth, missing the opportunity to use available soil moisture early in the spring. In addition, low soil pH affects growth. Therefore, alfalfa will yield higher when produced on soils with a pH of ≥6.0. Soil pH can be increased by applying lime (calcium carbonate), but it takes at least a year to effectively increase the pH. Phosphorus and potassium (K) fertilizer applied after first cut can help boost yield the second and third cuts with moisture, but if it is dry and plants do not grow, P and K will stay in the soil.
- Plan to plant warm-season annuals such as sorghum or millet alone or in mixtures. In 2021, farmers who planted forage sorghum in June had forage available in late summer and saved hay bales for winter. Forage sorghum was the only crop which had good yield in spite of the drought (4-6 tons/ac DM). Forage pearl millet is lower-yielding than sorghum but still very drought tolerant. Although many have concerns with prussic acid in forage sorghum, risk of toxicity if hayed is minimal since prussic acid dissipates as hay dries. However, nitrate toxicity remains a concern, especially in drought years. This is important when row crops have been fertilized with high nitrogen (N) rates and are baled as forage. Forage sorghum or millet, if fertilized with low N rates, will have less probability of high nitrate content.

In our trials, we planted forage sorghum mixed with silage corn. In wetter years, corn outproduced forage sorghum, but in drier years, sorghum outproduced corn. This way, whether you get a normal or dry year, your forage mix will be productive. We did not find differences in yield or nutritive value in forage sorghum/corn mixes compared with corn silage or forage sorghum in monoculture in any year.

Another alternative, especially if you need high-protein-content feed for cattle and do not have enough alfalfa, is an oat-pea mixture. Planted early, the mixtures will use stored soil moisture from fall to winter and spring rainfall, which will be enough to produce 2-3 tons/ac DM yield of high nutritive value by early to mid-July. Harvesting the hay in mid-July allows you to plant a cover crop mix that will produce forage for fall grazing.

Optimizing forage management and diversifying your pool of forages throughout the season are keys for stability and resilience of production. The more diverse your cropping system, the better prepared you will be for weather challenges next year.