Managing Drought-Stressed Alfalfa

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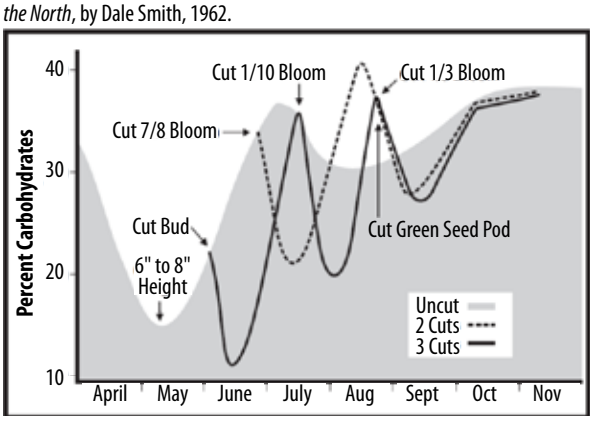
Much of North Dakota, South Dakota, and Minnesota are experiencing moderate to severe drought, causing alfalfa to wilt and dry. Some areas received rain after first growth had dried up, while other areas remain in drought conditions. During drought, forage is likely in short supply. However, harvest-timing decisions made now are important in keeping a healthy and productive alfalfa stand for future years.

In drought-stressed alfalfa, cell enlargement is inhibited, and stem internode length, leaf size, and leaf growth rate are reduced. It flowers at a reduced height, resulting in higher leaf-to-stem ratio and higher quality.

Alfalfa is a perennial crop, so keeping plants healthy is important in ensuring future forage. When alfalfa is stressed, its response is to replenish root and crown reserves (sugars, proteins) as soon as possible. Reserves are vital to support new growth from buds in the crown once soil moisture is available. Lowest root reserves occur when the plant is 6-8" before first cut. Reserves are replenished about the time the plant blooms (Figure 1).

Figure 1. Alfalfa root reserves evolution. Adapted from *Forage Management in the North*, by Dale Smith, 1962.



Drought-stressed alfalfa flowers early when still very short. The plant is accelerating its life cycle in an attempt to produce seed in the event drought continues and the mother plant dies. If drought persists, alfalfa will drop its leaves and go dormant until conditions improve. Alfalfa is well-adapted to survive a drought when managed correctly to avoid additional stresses.

The big question is whether to clip/mow droughty alfalfa. Clipping will not help the plant regrow faster when moisture comes back. If stands are not 12-15" tall or yield is not enough to cover harvest cost, leave alfalfa uncut until rain falls and dormancy is broken. Clipping or harvesting droughty-alfalfa at 6-8" causes additional stress, reducing future regrowth and possibly causing death. Root reserves are at the lowest at 6-8", so do not clip/mow alfalfa if shorter than 12-15".

Alfalfa under moisture-related stress. (*Photo: Sheldon Gerhardt, Napoleon, ND)*

If alfalfa flowers and never reaches 12-15", will it flower again this year? Yes. If soil moisture conditions improve, crown buds will grow new shoots to a normal height for a second cut (18-22"). Harvest should then be at 10% bloom stage and at normal recommended cutting height to make high quality hay. Leaving greater stubble height encourages regrowth from axillary buds at the base of cut stems, which are lower yielding growth points than the crown buds.

Avoiding additional plant stress, such as nutrient deficiency, insects, and diseases, is important. Scout and control for insects. Fertilize with phosphorus and potassium if soil tests indicate. Potassium (potash) is particularly important because it helps mobilize sugars to the root to tolerate drought stress and improve winter survival. Also, when soil moisture is replenished, alfalfa will have all the nutrients it needs to resume a vigorous growth.