

Fall Management of Pastures and Grass Hay Fields in Drought Years

As everyone is painfully aware, this has been a difficult year to adequately irrigate crops. Significantly below average rainfall has resulted in reduced surface water supplies and groundwater recharge. To make matters worse we have experienced several below average rainfall years recently and until recently this has been a fairly hot summer. For these reasons many growers are running short of irrigation water or have already been forced to quit irrigating their pasture or grass hay fields.

Dealing with a water shortage in alfalfa is easier than it is with most irrigated grass species. Alfalfa is relatively drought tolerant. It has a deep taproot so it is better able to access deep soil moisture, and when moisture levels are extremely low alfalfa goes into a “drought-induced dormancy”. The plant typically recovers fully and resumes growth when sufficient water becomes available. In contrast, some grasses are not as resilient and plant vigor and density can suffer after an extended drought period.

What is the best way to deal with a water shortage for your pasture or grass hay field and what can be done to minimize the negative effects of deficit irrigation?

Steve Fransen, Forage Grass Specialist with Washington State University, has some advice for how to manage irrigated pastures and grass hay fields under drought conditions. Steve points out that the calendar for grass plants actually starts in the fall. This is when root growth is initiated and new growing points (or meristematic tissue) are formed. This sets the stage for forage production potential for the following year. Root shedding in grasses typically occurs from late June until early September when the roots begin to regenerate. If you dig grass plants in fall and carefully rinse them with water you should observe the new white roots. Then over the winter root shedding occurs again (roots turn from white to tan to brown to black as they decompose) until new roots are formed again in spring.

The plant crown or stubble is extremely important for grass survival. That is where the plant stores sugars and carbohydrates for respiration and subsequent plant growth. Most legumes store the majority of their sugars in the tap root and crown. In contrast, around 85 to 90% of the stored grass sugars are in the stubble internodes—only a small amount of sugar is stored in the roots. If grass plants do not have adequate stubble for carbohydrate storage, plant mortality can occur. It may be tempting in a water-short year like this to get as much as you can out of a pasture and graze it to the ground. However, even though the stubble may appear brown and dead, it is not. It is simply dormant and the sugars and starches can be remobilized and used for respiration and plant growth. Therefore, it is important NOT to graze the bottom 3-4 inches of the grasses because their storage function is critical for next year’s production. So, what happens if the plants are grazed too close?

- The newly forming tillers can be starved of important sugars and starches
- The plant is more exposed and less protected from extreme weather
- Root formation is curtailed
- New tillers the following spring grow slower with fewer roots to support them

So even though it may be tempting to graze drought-stressed pasture close to the ground to greater utilize the available forage, this practice is a mistake in the long-term and is likely affect future productivity. You are best off to leave 3-4 inches ungrazed from fall throughout the winter even if that plant material appears dead.

Producers need to maintain the cows somewhere for fall and winter, and it is difficult to impossible to prevent the cows from grazing the stubble below 3-4 inches if they are fed on a pasture. Therefore, it is best to designate a small part of the property as a “sacrifice area” to house the animals so they will not consume too much of the stubble. This area can be a small pasture, dry range, dry lot, or a corral area. In effect, this area is “sacrificed” to protect your pasture from over-use at critical times.

The fertility status of the field is another factor to consider to help revive grasses after drought stress. Fall is a good time to fertilize pastures, including moisture-stressed pastures, with phosphorus and potassium. Oftentimes producers don't consider the phosphorus and potassium needs of grasses and think only about nitrogen fertilization in spring. Grasses need adequate phosphorus and potassium, and fall is a good time to make an application because these nutrients are needed for the development of new roots and growing points (meristematic tissue). Right now in early September is an ideal time. If growers apply P and/or K now they do not have to reapply these elements in the spring. An application of P or K now is not at risk of leaching from winter rains because these nutrients don't leach as do nitrogen or sulfur. It is fine to fertilize with these nutrients even when you don't have irrigation water or can't rely on rainfall for immediate incorporation, as these nutrients do not volatilize like nitrogen can from some fertilizer sources. Test soils now to determine whether your pasture is deficient in phosphorus or potassium.

While it is important to fertilize with P (and K if needed) in the fall, excessive rates of nitrogen at this time are discouraged because it can make plants more susceptible to winter injury. Nitrogen encourages growth and excessive N prevents plants from adequately preparing for winter by “hardening off” and accumulating proline (an antifreeze-like compound). As N application is increased there is a decrease in stored sugars in grasses. This increases the chances of winterkill.

In conclusion, there is no simple surefire way to improve pasture productivity in drought conditions. Adequate soil moisture is important for maximum productivity. However, to maximize the likelihood of a full recovery, it is important to leave 3-4 inches of stubble ungrazed and to fertilize with P and K in the fall if needed. In addition, it may be necessary to over-seed clovers in late February or March, as they are often killed after an extended drought period in the summer.

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