

Weather Pattern Effects & Watch-Outs Affecting Alfalfa & Mixed Hay/Pastures

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Past, Current, Future Weather

The summer and fall of 2023 brought drought for some geographies and wetter conditions for others heading into winter. Predictions from the National Oceanic and Atmospheric Administration (NOAA) proved to be true with much of the Midwest experiencing mild weather, a short period of freezing temperatures, and minimal snow accumulation.

Effects of Recent Weather on Alfalfa

Winter air temperatures, ice sheeting, soil moisture, and snow depth are all factors to consider when evaluating alfalfa coming out of winter. Most of the Midwest has experienced mild winter conditions; however, there are challenges this may bring.

Watch-out Topics from Least to Most Concern for Winter 2023/2024:

- **Snow Depth.** Snow depth is one of the most important watch-outs for typical winters in the Midwest. For much of the Midwest, when areas experienced damaging air temperatures ranging from 5-15°F, snow was abundant. In areas where freezing temperatures existed with little to no snow cover, stands should be evaluated as alfalfa breaks dormancy. Snow depths of 4-8" are important for insulating the soil, which mitigates extremely cold air temperature exposure to alfalfa crowns and reduces solar energy absorption, minimizing soil warming during winter. Due to the mild temperatures, snow depth in most geographies of the Midwest is not a concern.
- **Ice Sheeting.** Ice sheeting develops from snow melt followed by freezing temperatures or freezing rain events. The ice sheet will smother alfalfa plants, reducing air exchange to alfalfa crowns. Without this exchange, respiration shifts from aerobic (with oxygen) to anaerobic (without oxygen) and results in the plant using up energy reserves. Alfalfa is usually able to tolerate short periods of ice sheeting, up to four weeks, so this isn't a large concern with the mild winter the Midwest has experienced thus far. However, it will need to be considered through the remainder of the winter season.
- **Soil Moisture.** Fall soil moisture can affect the dormancy reaction of alfalfa. From previous experience (2019), abundant moisture in the fall can be detrimental to plant cells when the soil freezes. Most of the Midwest was fairly dry last fall; however, as stated, we have had mild temperatures and there is minimal frost in the soil. Still, current soil moisture and warm soil temperatures can lead to disease pressure, especially on older stands. This is variety-dependent, as improved varieties with good winter survival and disease resistance ratings will perform better than those without these characteristics. Both improved and older varietal stands should be monitored equally.
- **Winter Air and Soil Temperature.** In a snapshot of current weather, the mild winter and soil temperatures are most concerning. Air temperature is least concerning for alfalfa plants enduring temperatures down to 5-15°F. Most concerning is the warming of soil due to warmer temperatures and minimal snow cover. Environments with above-normal air temperatures, which cause soil temperatures to reach more than 41°F, can result in plants breaking dormancy. If current temperatures remain mild, plants may continue to grow.

However, if extreme cold or icy weather is experienced after dormancy has broken, the root reserve has since been marginally utilized, and severe winter injury can result. Another thing to consider is that when the plant breaks dormancy and begins to utilize root reserves, the weather then forces the plant back into dormancy. Those root reserves have minimal time, if any, to recover. This will lead to challenges in winter survivability for weeks to come, ultimately leading to potential yield losses in the first harvest.

- **Cool Season Grasses and Other Forage Legumes.** Many of the concerns discussed can impact cool season grasses and other forage legumes as well. Monitoring these along with the alfalfa is important. If marginal loss is expected, frost seeding can be used to thicken up stands as a preventative measure. Cool season grasses tend to be increasingly winter hardy over alfalfa and are often overlooked. Cool season grasses go dormant during winter months but capture much less energy stored in their roots and crowns. Grasses tend to tiller extensively in months leading up to winter dormancy, balancing growth and energy storage for growth following dormancy break the following spring.

While it may appear beneficial to let animals out early, once spring is here remember to allow adequate growth before doing so (6-8" minimum). Allowing grazing too early can lead to stressing of grasses, and ultimately delaying spring green-up. The weather outlook for spring in the Midwest appears to be on the drier side so from a plant health perspective, these grasses will need time to develop and combat early potential drought conditions.

Final Thoughts

Monitoring and scouting alfalfa this spring will be important to planning crop rotation. Analyzing older and marginal stands early will be beneficial to capture rotational benefits from alfalfa and allow forage stocks to be managed appropriately. The same holds true for grass stands, mixed hay, and pastures.

A careful assessment of alfalfa stands including age of stand, stem counts, crown and root health, weed infestation, past fertility management, and survival will be integral for early decision-making. ☘



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