Forage News

MISSISSIPPI STATE UNIVERSITY EXTENSION

How Do Pastures Respond to Cloudy Days and Wet Conditions?

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Weather affects plants in many ways that we may not realize it. Weather is what is happening now or over a growing season such precipitation, humidity, temperature, wind, and sunlight. On the other hand, climate is historical weather or average weather conditions over a long period of time.

Weather conditions in Mississippi has been wet and cloudy for most of the winter months. However, conditions can change from day to day. Cloudy days can have an impact of photosynthetic activity and therefore, winter annual pastures do not accumulate the amount of sugars needed for growth and development. During the day, plant accumulates sugars and in the evening the plant use the sugars for growth and sugar levels might decrease. In instances of stress such as cold nights, water logging, and cloudy days, plants sugar levels might still be high the following morning since they were not synthesize into fiber for growth and development.

Cloud cover and prolonged rainy conditions can impact plant growth. The frequent occurrence of clouds over extensive periods of time may have a significant influence on photosynthesis and transpiration of cool-season annual forages due to effects of variation in sunlight quantity and quality on photosynthetic activity and leaf temperature. Under cloudy conditions, winter annual crops might try to produce bigger leaves in response to low radiation while wet conditions can limit root development and nutrient uptake as roots might not seek nutrients deep in the soil profile. Water logging is accentuated by rainfall, temperature, cloudy conditions, and soil type that limits vertical water movement. Soil temperatures remain at lower levels in wet soils.

Under water logging conditions, grasses might have yellowing symptoms and stunted growth. Excessive soil water saturation blocks the transfer of oxygen between the soil and the root zone. Low oxygen levels cause a decrease in root growth (root branching and less finer root hairs) and nutrient absorption and impact the overall forage growth. Under water logging conditions, the availability of several nutrients such as nitrogen (N), iron (Fe), Zinc (Zn) are reduced while manganese (Mn) availability might be increased. In general, the uptake of N, potassium (K) and Fe is impaired in the roots by the lack of oxygen. Denitrification and leaching of soil mineral N can results in less N being available to cool-season annual grasses. Under waterlogged conditions, the uptake of phosphorus (P) and K may be reduced and lead to early maturing or senescence of the plant. Anaerobic (no oxygen) conditions in water logged soils can cause leaching of nutrients such as K, Sulphur (S), and N from the soil and also the production on toxic gases such as hydrogen sulphide and carbon dioxide which can drastically affect root growth.

Table 1. Comparison of weather conditions in south Mississippi during the winter grazing season (November to February).

November - Feb	4 Year average	2018-2019	Difference
Precipitation, in	19.81	30.89	11.1
No. Clear days	11	4	-7
No. Cloudy days	23	38	15
Max Temp, ºF	66.5	64.1	-2.4
Min Temp, ºF	42.6	50.8	8.2
Average Temp, ºF	54.5	54	-0.5
Grazing days	88.5	64	-24.5

The gains of stocker cattle are largely related to quantity and quality of the pasture as well as total grazing days. However, due to prolonged periods of rain fall, many pastures can be damaged due pugging, especially in heavy clay and clay loam soil types. Pugging is nothing more than livestock tearing apart the pasture's soil structure. It depends on factors such as soil type, amount and frequency of rainfall events, forage species, and pasture management. As the soil becomes very wet, it loses strength and reduces its ability to withstand soil compaction and pugging. This prevents the water from dispersing through the soil and impacting plant growth. Normally, pugging in winter grazing might range from 10 to 20% of the pasture's area, but with the amount of precipitation received over the last three months, that number can easily range from 40 to 60%. This can have huge implication in spring forage growth, summer pasture recovery, and soil biological activity that is vital to a healthy soil environment. There is also a long-term effect on soil organic matter decomposition and nutrient cycling and more difficulty to restore or improve soil structure.

One of the most frequent questions that have been asked in the last month or two has been "how is your grass looking?" Most of the pastures in South MS have been having difficulty with regards to their growth in the last few months due to the excessive rain. The issue has been noted at the White Sand Unit in Poplarville, so we contacted the National Weather Service (NWS) and used archived data from Hattiesburg (closest area to Poplarville). Since our grazing can begin in November, data examined were from November 1 until Feb 28 (close to the date of this writing). This year, the White Sand Unit has had about 64 grazing days for our studies. Those were calculated based upon having sufficient forage to maintain an animal without supplement (either hay or feed) using forage biomass measurements. Using historical data from Nov 1 to Feb 28, across the years from Nov 2014 until Feb 2018 we have averaged 88 grazing days. Unfortunately, the data we had available from NWS only went to 2014, so those were the data used. On average we are -2 ^{o}F from the average temperature for the period of Nov-Feb. Looking at rainfall data we have 11 inches more rain compared to the 4 year average for Nov-Feb, additionally we have more days of greater single event rainfall compared to the 4 year average as well. In some areas of the Experiment Station have not been able to fertilize simply due to the pastures being consistently wet thereby not physically allowing us to get a spreader or bugging into the pasture, and other producers have shared similar situations. The NWS also had interesting data regarding number of sunny days and number of cloudy days. Since Nov 2018, we have had 14 fewer sunny days compared to the four year average, and have had about 15 more totally cloudy days compared to the four year average. The lack of sunny days may reduce the amount of photosynthetic activity, coupled with saturated soils and lack of fertilizer may help explain why our grazing days have been greatly reduced.

Just remember, no matter how well you plan your winter grazing, Mother Nature is always in charge! All you can do is stay ahead of the weather to meet the forage needs of the livestock. Keep in mind that out of ordinary weather conditions can impact pasture growth, pasture utilization, nutrient uptake, increase weed competition, reduce forage nutritive value, impact soil structure, and pose animal health issues.

Upcoming Events

March 12, 2019—Outdoor Business Workshop for Landowners, Kiln, MS
March 19, 2019—Cover Crop and Grazing Field Day, Raymond, MS
March 29, 2019—Legume Workshop, Tuskegee, AL
April 4, 2019—Coastal Plain Forage Field Day, Newton, MS
May 11, 2019—Small Ruminant Workshop, Hattiesburg, MS
July 16-17, 2019—Southern Cover Crop Conference, Auburn, AL

For upcoming forage related events visit: ***http://forages.pss.msstate.edu/events.html***

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