Economic Impact of the Summer 2022 Drought on Arkansas Forage Production

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Background

In recent months, drought conditions have intensified in the Southeastern U.S., impacting forage production. According to the most recent USDA *Crop Progress* report, 21% of pasture is in poor or very poor condition in the Southeast. In Arkansas, conditions are much worse, with 75% of pastures in poor or very poor condition. This article aims to estimate the economic losses of the drought on forage production in Arkansas.

In Arkansas, there are two main uses for forage. First, livestock producers will graze cattle, horses, and small ruminants on pasture to utilize their forage resource. Arkansas does not have a significant cattle feeding sector, so most ruminant livestock production is done using perennial grass and annual small grains pasture. January 1 cattle inventories in Arkansas totaled 1.69 million head in 2022. Small ruminant inventories in Arkansas totaled 35 thousand head.

Second, many Arkansas farms will harvest hay to meet their own winter forage needs or to sell it to other producers. USDA records production data for two hay categories: Alfalfa and All Other Hay. All other hay is the relevant category for Arkansas, which has a marketing year that starts in May and ends the following April. For the 2021-2022 hay marketing year, Arkansas ranked 7th in other hay production, which totaled 2.6 million tons.

Forage growth depends on several factors, including timely rainfall. A lack of timely precipitation is a significant source of risk because of its effects on forage yield. This is the situation that Arkansas producers currently find themselves in. Add production cost inflation affecting fertilizer, herbicides, pesticides, fuel and other key inputs and this could be one of the most expensive years for forage production in recent history. In short, drought and production cost inflation will make this a challenging year for forage producers in Arkansas, and the effects will transmit throughout the state's agriculture economy.

Analysis

Analysis of the drought's economic impact on forage production needs to consider both types of forage use in Arkansas. In this article, we estimate drought impacts for pasture and hay separately. The economic estimates reflect current economic losses on forage production in Arkansas. Throughout this section, we document the assumptions needed to arrive at our economic estimates.

Based on the 2017 U.S. Agriculture Census, Arkansas has 3.189 million acres of permanent pastureland. Assuming changes in acreage between 2017 and 2022 are negligible, 3.189 million acres is the basis for valuing forage production intended for grazing. The 2022 USDA-RMA county base value of forage production for grazing is $54.51/acre in Arkansas. This implies the total value of grazing acreage in Arkansas is $174 million.

On average, livestock producers graze pasture nine months per year (providing hay and supplemental feed during the other three months). As such, we can distribute $174 million evenly across those nine grazing months when forage production is sufficient to support cattle. Drought occurred from June through August 2022, impacting $58 million of grazing forage production. We assume that during those months, forage production was reduced by 13.9%. This implies an estimated loss $24 million for grazing pasture.

Arkansas 2021 hay acreage totaled 1.180 million acres. Assuming changes in Arkansas hay acreage between 2021 and 2022 are negligible, 1.180 million acres is the basis for valuing hay production. The Livestock Marketing Information Center (LMIC) forecasts that hay prices will average $153/ton in 2022. Assuming a long-run average hay yield of 2.02 tons/acre, the value of Arkansas hay production totals $365 million.

Drought impacts hay yield and the number of cuttings producers get from their fields. It's difficult to determine how the drought impacted hay yield separately. Combined, we estimate that the drought reduced hay production by 20%. Multiplying hay production losses by the estimated value of hay production results in an estimated loss of $73 million.

On average, total economic losses for pasture and hay are $97 million. Table 1 includes the numbers and calculations to arrive at our estimates. Of course, the economic losses from drought go beyond the immediate impacts on forage production. The next section provides a qualitative discussion of those other potential losses.

Table 1. Estimates of the Economic Impact of Drought on 2022 Arkansas Forage Production

	Value of Production	Acreage	Yield	Total Value	Loss of Forage	Value of Loss
	Dollars/Acre	*# Acres*	*Tons/Acre*	*Mil. Dollars*	*Percent*	*Mil. Dollars*
Haying	$153.00	1,180,000	2.02	$364.69	19.90%	$72.57
Grazing	$54.51	3,188,973		$173.82	13.90%	$24.16

Source: USDA-RMA, LMIC, and USDA-NASS.

Other Considerations

Arkansas precipitation totals for the week ending July 30, 2022, ranged from <1 inch in south Arkansas to 4-6 inches in northwest Arkansas. These precipitation totals do not mean that drought impacts in Arkansas are over. In an ideal situation, it will still take several weeks for pastures to recover enough to support livestock. It's unlikely that hay production in August and September will offset the losses experienced in June and July.

The effects of the drought in Arkansas will extend into the winter and beyond. This summer, the loss of hay production means that producers will have to purchase expensive feed and hay. LMIC forecasts an average hay price of $153/ton, and USDA forecasts an average corn price of $6.65/bushel for the 2022/2023 marketing year. Higher hay and feed prices this winter will raise the cost of production for Arkansas livestock producers.

This summer, with drought-stressed pastures, Arkansas livestock producers had to make tough decisions about their herds. Producers had to decide whether to start feeding hay, depleting winter hay stocks, or selling off part of or the entire herd. Specifically, for Arkansas cattle producers, there is some evidence of larger volumes of cull cows and bulls coming to market. For the first thirty weeks of 2022, cull cow and bull volumes at Arkansas auctions are averaging 20% higher than in 2021.

Cattle producers in Arkansas primarily market feeder calves in the fall after weaning. The lack of forage caused by this drought has impacted the average gains and weights of the cattle that have and will be sold this year. Cattle producers are paid by the pound, and a lighter-weight calf

will mean fewer total dollars from calf sales this fall. The lack of hay production coupled with high grain prices will limit opportunities to retain ownership of calves through the winter. Higher prices in the market have partially offset this impact. However, the loss in efficiency attributable to heat stress and poor nutrition will follow this year's calf crop all the way to the packer.

For Arkansas livestock producers, breeding stock is a capital investment. Producers spend a significant amount of time and money improving the genetic makeup of their herds. To the extent that the drought forced producers to sell breeding stock, the economic loss includes the loss in asset value and the opportunity cost of future livestock production. These values would be hard to estimate but should not be overlooked.

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