

Carrying Capacity Versus Stocking Rate

Getting the numbers right pays dividends.

Understanding the difference between carrying capacity and stocking rate and applying them correctly can make for healthier pastures and stronger bottom lines.

As it is, Devlon Ford, a regenerative ranching advisor at Noble Research Institute, often hears these terms defined different ways, used interchangeably or confused with one another, which can lead producers to overgraze their land.

“Stocking rate is strictly a management decision,” Ford says. He explains stocking rate is the number of animals you choose to place on your ranch or the rate at which your land is stocked.

Carrying capacity, on the other hand, is a calculation that tells ranchers exactly what their land can support.

“In our classes, we talk about carrying capacity as the maximum number of animals you can run based on certain criteria,” Ford says. He uses successive images of a stock trailer being loaded with cattle to make his point. The trailer is rated for 12,000 pounds — its carrying capacity. Cattle loaded onto the trailers are equivalent to the stocking rate. In his example, the trailer is about three-quarters full when the trailer’s 12,000-pound capacity is reached. As he adds more cattle to fill the available space, the stocking rate grows well beyond carrying capacity.

“We’re going to wear out our bearings, springs or tires. We’re going to blow out these tires eventually and be stranded somewhere,” Ford says. “And that’s the same thing with our carrying capacity on the ranch. If we set our

stocking rate too high, especially if it goes over our carrying capacity, then we start harming the microbes, fungi and all those living organisms in the soil.”

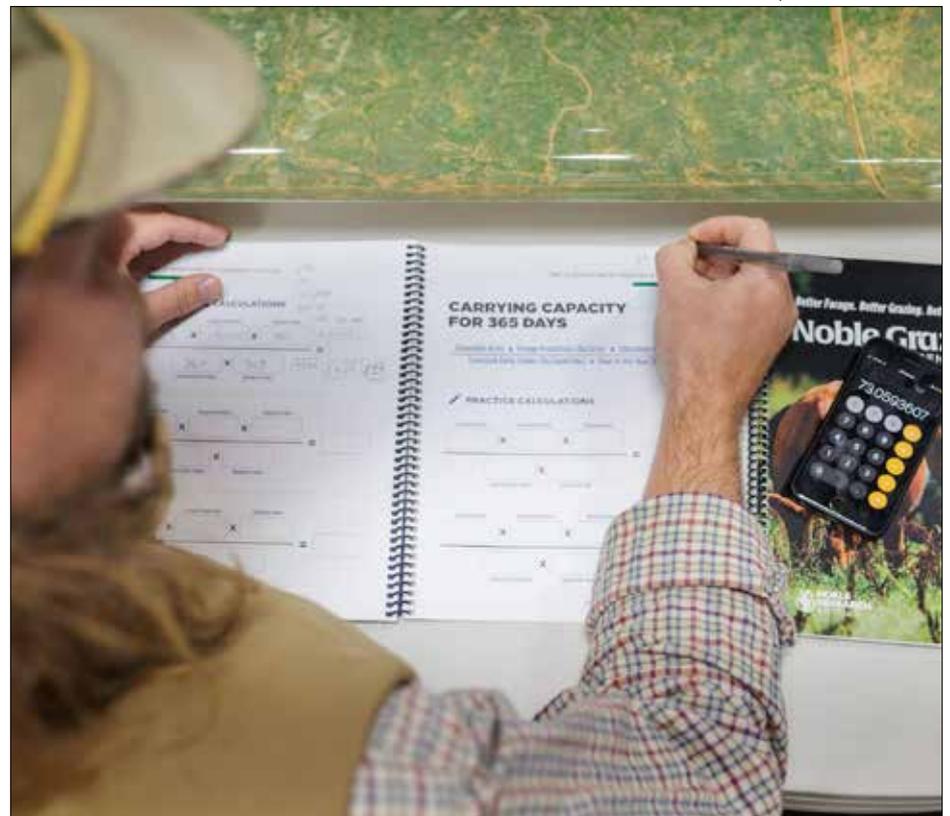
Critical calculations to prevent overgrazing

Extending Ford’s trailer example, ranchers must first determine their land’s true carrying capacity — grazable acres. Non-grazable acres include a

homestead area, roads or lanes, wooded areas and even oil or gas drilling pads.

Next comes estimating forage production per acre. If historical records aren’t available from past grazing or haying seasons, Ford says, “You can go back to the old grazing sticks — that’s a decent way to get a baseline measurement. For a digital approach, you can go to the USDA’s Web Soil Survey website or Rangeland Analysis

Photo courtesy of Noble Research Institute



Avoiding overgrazing starts with knowing how many of your acres are actually grazable and is a key part of calculating an accurate carrying capacity.



Your stocking rate should be based on your carrying capacity, and aligning the two can lead to long-term payoffs for your operation.

Platform to get a baseline forage production number.”

Ranchers choose how much of the available forage to use, which is calculated as a percentage. Ford recommends ranchers set the utilization rate below 50% in making their calculations.

Next comes estimating how much forage will be consumed by the cattle that will be stocked — the average daily intake. Multiply the average weight of the livestock by a standard intake percentage.

“If you’re running a cow-calf operation, we’ll typically suggest using 2.6% to 3%,” Ford says. “When I was in college, we talked 3%. It’s changed; now a lot of people are saying 2.6%. Either number is a good place to start, but if you use 3%, you’re a little bit safer.”

Then multiply the average daily intake by the number of days you plan to graze. Ranchers who don’t plan to substitute graze with hay would multiply by 365 days.

“Once you do all the math, it will tell you how many animals your operation can run,” Ford says. “Quite often, that’s an awakening moment for people.”

Determine stocking rate from carrying capacity

Knowing your ranch’s carrying capacity for the year can support soil health and

grazing goals, but there are a few other things to consider when right-sizing your ranch’s herd.

“Some people want to set their carrying capacity at 100%,” says Ford. “But what if you get any years of drought? One thing we’ve got to keep in mind is that since carrying capacity is heavily dependent upon forage production, it’s also heavily dependent upon rainfall and climate.”

Carrying capacity can change annually and seasonally as precipitation and degree days ebb and flow. Ford recommends stocking ranches at some percentage below carrying capacity.

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Noble Research Institute

“For instance, say you set your stocking rate at 80% of carrying capacity. Then, if you get in a drought

situation, you may be able to weather that drought based on the forage you already have without selling cows,” Ford explains.

Alternatively, in good years, Ford says there are opportunities for ranchers who have more grass than they need. Ranchers can bring in another enterprise, like stocker calves or do some custom grazing. Likewise, ranchers in this situation could use the bountiful forage as an opportunity for prescribed burning or to give pastures additional rest.

Ford admits that reducing herd size to optimize an operation can be a tough concept for ranchers to accept. When ranchers run the numbers, though, he says they often find that aligning their stocking rate with their ranch’s carrying capacity pays off in the long term. **BA**

Editor’s Note: This is part of a continuing series of articles about regenerative ranching from Noble Research Institute, long trusted by beef cattle producers for supporting the industry with research, education and consultation. Follow the series in future issues of *Baldy Advantage* and *Hereford World*, as well as in special *1881* podcasts, at Hereford.org. Additional regenerative resources and past articles in the series are also at Noble.org.

Laura Brenner is a senior content writer at Noble Research Institute.