Carrying Capacity with Sheep

—Ulf Kintzel

Photo by Author

One very frequent question I encounter is the question of stocking rate: "How many sheep can I raise per acre?" My answer always is: "It depends." That answer would make for a very short article. So let's examine on what factors it depends. Let's define carrying capacity with sheep so we are on the same page: It is the number of ewes and their lambs that you can raise annually on one acre of land. So whenever I mention "ewes per acre," the lambs are also considered in addition to this figure but not mentioned. For example, if you assume two ewes per acre and you have a lambing rate of 1.5 lambs per ewe, you end up having two ewes and three lambs per acre. Yet, only the two ewes will be mentioned. That is how I learned it almost thirty years ago and that is how I will use it in this article.

Conventional wisdom has it that you can raise about four ewes per acre (10 ewes per hectare). Such a high number would require an optimal scenario, good soils, and a lot of input. I have seen it done in England. The input was enormous, but it can indeed be done. I raise approximately 2.5 ewes per acre and in addition 150 to 200 purchased feeder lambs with minimal input and extended grazing season due to stockpiled grass. I would say any number between two and up to four ewes per acre is possible, depending on what you are willing to do and what you consider a desirable bottom line. Of course, I am talking about areas like New England, the Northeast, or those parts of the Midwest where you can grow cool season pasture and the "usual" crops like corn and small grains without irrigation. I have no experience with arid climates or irrigation and won't pretend that I do.

Here are some factors on which the carrying capacity depends:

Soils. The quality of the soils itself, as well as the condition that they are in (well-maintained with high organic matter or depleted of nutrients), are very important. If you have shallow soils with poor or mediocre water-holding capacity, you will quickly find yourself running short on grass when summer weather arrives. Feeding animals at that time is more costly than in the winter, since lambs in the summer need to gain weight and some need to be finished to go to market. So high-quality feed is required. Winter-feeding, on the other hand, is most often maintenance, and lesser-quality hay as far

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as nutrients are concerned will do. Calculating the carrying capacity should not be based on when the grass grows best, especially when you mostly graze. The quality of the soil, and particularly its water-holding capability, was perhaps the most important factor when I moved here. While in New Jersey, some prolonged dry weather in the summer always meant an almost immediate hold on growing grass and it very often turned brown. Here in upstate New York it takes a whole lot longer before the grass stops growing, and even then it tends to stay green, at least for much longer.

Climate. A long winter season, especially with heavy snows, followed by a short growing season affect your carrying capacity. States that have little to no snow with a very long growing season where you ideally can graze all year long have a higher carrying capacity since there is no or a reduced need for making hay. All other factors being equal, a farm in northern Vermont does not carry as many sheep per acre as a farm in Missouri does. But who wants to live in Missouri anyway, right? Upstate New York is still a far better place to live and farm, but I digress and shall return to the facts…

Perfect weather versus not so perfect weather. How many of you can point at a year when you have said, "This year the weather was just right"? I am going out on a limb here and claim you can point more often than not to a year when the weather was not so perfect, with a perfect year being the exception. Your calculation should not be based on the best case scenario. I always like to leave some wiggle room, meaning calculating a carrying capacity a little lower than the best case scenario allows. At the same time, I do not calculate based on a worst case scenario. Being overly cautious is not good either. In this area a worst case scenario for me would mean a drought. If I do have a drought, I have to deal with it.

Feed bought in or grown yourself. If you buy grain to feed your sheep, you are also having quite an input on fertilizer, simply because the sheep digest that bought-in grain on your farm. The same holds true if you were to buy forage for a grass-fed operation. Buying feed certainly increases your carrying capacity. While I initially purchased hay the first few years that I was at this location simply because the farm was run down, I now have all my hay made at the farm. Only if I run short, as I did this year with the dreadful winter we had, do I buy some hay, purchased at the local hay auction. I choose to make the hay on my own farm because I tend to not keep up with the growth of the grass in the spring despite 150 to 200 additional feeder lambs. I would keep even more sheep, but then I would have too many sheep in the summer when growth of the grass slows down. On the other hand, if you have a good source to purchase stored forage feed it is certainly worth doing it that way. There is no cheaper way of fertilizing your farm.

Fertilizer. I feed my hay mostly outside, usually in the same fields that it was made. I also frost-seed red and white clover. My clover content is no less than 30 percent and goes as high as 50 percent in some fields. That way I hope to take advantage of the nitrogen-fixating capability of these legumes. I would probably spread lime if I would need to, but my limestone-derived soils lead in most places to a relatively high pH level. White clover and bluegrass, both indicators of appropriately high pH levels, thrive in most places of our farm. So currently I skip liming altogether. I don't entertain using commercial fertilizer. However, spreading commercial fertilizer would indeed increase the carrying capacity. It also would increase costs, and in addition would affect cash flow and the ability to pay expenses out-of-pocket without borrowing any money. In my view, that is a valid concern.

Rotational grazing versus set-stock grazing. I hope that by now all of the readers of this magazine are aware that rotational grazing is a must if you want to be profitable. You increase your carrying capacity greatly by rotationally grazing. There just is no good reason to have a set-stock pasture. How often should one rotate? I don't consider being

in any one pasture for a week or more as rotational grazing, since you are definitely grazing regrowth. (Because you are grazing regrowth it actually stops being rotational grazing when your rotation schedule goes beyond a week, even if you "rotate" after that week.) Rotating every five days is, in my view, a minimum. Every three days is more desirable. I do it every day with some exceptions. On the other hand, I don't find that the benefits justify rotating more than once a day unless you have an intern that needs to be kept busy or you run a sheep dairy farm where rotating twice a day is entirely reasonable due to twice daily milking.

Annual cycle. Unless you custom-graze livestock (which is more common with beef) and you are at liberty to stock and de-stock your pasture as you see fit, you may have already found out that it is very hard to match the number of sheep to the cycle of grass growth. I myself am still struggling with it. When spring starts and the grass begins to grow, any farm carries more sheep. When the grass grows the best in the spring, from perhaps late April and into June, the number of sheep should be highest. Most areas experience a summer slump in grass growth or at the very least it will grow with a slower speed. In the fall you will again have a flush in growth followed by the winter season when you depend on stockpiled pasture (which you need to start setting aside in August and September) and winter feed. So the ideal case would be that you have the most animals that can graze during the spring and into early summer. That requires winter lambing. I do that in part for that particular reason (the other reason being marketing). Many lambs are old enough by early spring to graze fully right away and will be finished and sold by the time I graze the last parcel after it slows down growing. In addition, I purchase about 150 to 200 feeder lambs (also White Dorper crosses that are grazing genetics), of which many are only on the farm for this short period of growing season. When fall starts, I like to have the lowest number of sheep possible, because I want to be able to stockpile pasture for winter grazing. I understand that winter lambing is not desirable for many and that spring lambing is a far easier way of lambing, especially for the inexperienced. On the other hand, I am in the unique situation that raising sheep is all I do and that *all* my land is used for grazing and haymaking. Others may have a much smaller flock, which may allow more flexibility as far as allocating land or hay fields for grazing are concerned. To give you an example, I know of a farmer who purchased breeding stock from me who grows mostly hay for horse people. He lives close to a racetrack, which provides an excellent market for hay. He is at liberty to use as many or as few hay fields for pasture, depending on the growing season, and hays most of his fields. This is just an example. Other examples could be rotating pasture and fields with crops, or creating some pasture with annual crops (i.e. oats, annual ryegrass, brassica, turnips, etc.) can be a solution for dealing with varying grass growth at different times of the year. In any event, some nimbleness in thinking is required if you don't wish to let land sit idle because you sometimes have fewer sheep than you need, considering the acreage you are using at that time.

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Winter feeding versus winter grazing. I like to extend my winter grazing season for two reasons. First, here is the real obvious reason: It lowers the cost of winter feeding. Secondly, the less obvious reason is the fact that stockpiled pasture is of much better quality than hay and perhaps only rivaled by far more costly haylage. So you not only feed your sheep at a lower cost, you also feed them better. My hay feeding season lasts about 100 days, from approximately the beginning of January to the very end of March or to very early April. Even this year, with the long winter we had, I stopped feeding hay on April 15. If I were to calculate the usual 150 and up to 180 or so winter feeding days that are common in my area, I doubt I would do okay feeding my sheep just first-cutting hay for this entire time, let alone lambing in the winter with hay as the only feed source. So given the fact that I will have hay as the only source of my winter feed, I also must increase my grazing season to at least the first of the year. This fact requires a lower number of sheep per acre than otherwise possible.

Profit margin. With each increase in numbers of sheep per acre, your input will rise or your grazing season will be shortened, or both. Your profit margin per lamb will shrink. How much would you like to pocket per lamb once you paid your expenses? One hundred dollars? Fifty dollars? Ten dollars? You be the judge. The less money you feel you need to make per lamb, the more sheep per acre you can raise. That is entirely up to you. However, I will not get out of bed for a lamb that profits me only ten dollars. In my view it would have to be more to bother raising these additional lambs.

Personal management and preference: Yes indeed, unless you are an economics professor, this does enter the equation—the search for your personal sweet spot. I currently run about 250 ewes, raise their lambs and an additional 150 to 200 feeder lambs, and direct-market most of my lambs. In addition, I do some sheep dog training, including hosting an annual herding trial. In addition, I do a few other things like raising various kinds of poultry for the family, write articles, market some of my lambs and a great number of the lambs of two other farmers to a vendor, grow mushrooms, and last but not least, enjoy spending time with my family, which includes things like berry picking, fishing, hiking, and birding. Throughout most of the year, my days are maxed out. There

is no boredom around here. I have some downtime in the winter before lambing starts again in late January and early February. I need that time to build up energy and ambition. Also, I enjoy the fact that the profit margin per ewe remains relatively high due to a very long grazing season and low costs. I get to stockpile pasture, but I also go off the farm for about a month to six weeks in the fall and graze hay fields at some neighboring farms. That is time consuming but definitely cost saving.

Land prices. On a side note I would like to mention land prices. My description is based on reasonable land prices. If your land prices are very strong, if you pay $6,000 or $8,000 or more for an acre of land, I don't even want to suggest raising sheep as your main source of income. This changes a little if you have a very special market, are a breeder of sought-after sheep, or have a sheep dairy. Otherwise, commodity sheep won't pay the mortgage. On the other hand, raising sheep has the benefit of getting into the business with relatively little input and little capital to start.

Back to my current carrying capacity of about 2.5 ewes per acre, given all the specific factors I outlined. (Of course, this current number would get closer to three ewes per acre if I would not buy in the feeder lambs but would certainly not exceed three ewes per acre.) Could I raise more sheep per acre than I currently do? Definitely. Do I want to? No. Aside from some tweaking of the current model, which always happens, I have found my sweet spot. The additional labor that I would have with more sheep would come at a higher cost and with a lower profit margin because my grazing season would be shortened. In addition, it would add to an already busy schedule. Something would have to give. I have noticed that whenever I have lots to do, I tend to want to get the "actual" work done and let the marketing slip a bit. I come inside at sunset in the summer and all I have energy left for is sitting in my comfortable chair. I no longer wish to pick up the phone or write an e-mail. (This article, for instance, was mostly written when we had subzero degrees in the winter and not this spring while the sun was shining!) That leads to temporarily unhappy customers and every once in a while one who takes his or her business elsewhere. So is it worth increasing the number of sheep I have because according to the "official" carrying capacity I actually could? I'd say no. However, that is for each one to decide individually. There is no one "right" answer. Each and every farm is unique and my suggestions are food for thought, not a list of answers.

Lastly, I need to add a personal note which influences my decision, rightly or wrongly. I hate running out of grass. I chose the word "hate" purposely, although I almost never use this strong word. Running out of grass literally causes me to sleep badly, and I'd rather have some grass left and a scenario under which I could have raised a few more sheep than having to worry about what my sheep will graze tomorrow or next week or next month. Clearly, that is a personal thing of mine. I can't help it. It is. So for me 2.5 ewes per acre is a good number. Instead of asking me the next time: "How many sheep can I raise per acre?", you can now figure out what suits you. If you think you can raise more sheep per acre than I can…well, I will always have a few that I can sell you.

Ulf owns and operates White Clover Sheep Farm and breeds and raises grass-fed White Dorper sheep without any grain feeding and offers breeding stock suitable for grazing. He is a native of Germany and lives in the U.S. since 1995. He farms in the Finger Lakes area in upstate New York. His website address is www.whitecloversheepfarm.com. He can be reached by e-mail at ulf@whitecloversheepfarm.com or by phone at 585-554-3313.