

The Contributions Approach to Establishing Equitable Pasture Lease Agreements

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Land is one of the most commonly leased assets across the United States. Cropland and pastureland are typically leased for agricultural production purposes, while forestland may be leased for timber or recreational uses such as hunting. Agronomic and physical characteristics of land differentiate cropland from pasture. However, the land's intended use generally determines whether the land is cropland or pasture. Differentiation of land use is important because it guides the lease agreement's structure and is beneficial when constructing terms acceptable to all parties.

Establishing an equitable agreement is in the best interest of the landowner (lessor) and the renter (lessee) because having a lease will minimize potential conflicts. Constructing an equitable lease or rental agreement can be difficult because there is no specific method for developing a lease agreement that is agreeable to both the landowner and the renter.

Factors dictating and influencing the negotiations process include local supply and demand conditions, current and future market conditions, and prior working relationships. When constructing a pasture lease, it is advantageous to consider all participants' needs because the success of the lease is highly dependent on participant satisfaction. Both the landowner and renter should attempt to recover direct and opportunity costs when entering into a lease agreement.

A number of traditional lease arrangements are available. One such option is a fixed cash lease in which the renter pays the landowner a fixed amount at a specified time, and the renter provides all management for the leased pasture. This may seem like an equitable lease at first if both parties are able to agree on a price. However, an agreement of this manner may lend itself to mismanagement of assets. For instance, the renter may harvest hay off the land but never fertilize the land, resulting in the "mining" of soil nutrients. The loss of soil nutrients (nitrogen, phosphorus and potassium) is a cost to the landowner that is difficult to recoup from the renter.

Recognizing the shortcomings of the fixed cash lease, this publication considers a method called the contributions approach. The contributions approach uses annual cost estimates of owning and operating a pasture enterprise and divides receipts among the lease's participants equitably. This approach should be an agreeable method for formulating leases for grazing animals such as dairy cattle, beef cattle, sheep, goats and horses.

The objective of this publication is to provide a framework for developing an equitable lease agreement using the contributions approach as a methodology for establishing an acceptable pasture lease rate for all parties. To achieve this objective, it is necessary to address the primary components of the agreement, including:

- Determining the stocking rate of livestock on the pasture.
- Establishing the total contributions from both the landowner and the livestock owner.
- Examples of using the contributions approach to establish lease rates.
- Other factors to consider when establishing a pasture lease using the contributions approach.

Stocking Rates

An important component in formulating pasture lease agreements is determining an agreed upon stocking rate. The stocking rate is important because it has major implications for the profitability and sustainability of the pasture. While assets such as corrals, barns, fences and water are important in pasture lease agreements, the primary focus of a pasture lease agreement is usually the forage stand. The livestock owner has an interest in stocking and managing the pasture to maximize forage utilization relative to his/her costs. The landowner's interest should be maintaining or improving the forage stand, which means maintaining a stocking rate that will not stress the forage stand and result in additional maintenance or re-establishment costs. Therefore, it is beneficial to specify a stocking rate in the lease agreement because it can reduce disagreements between participating parties and help maintain the integrity of the forage stand.

Stocking rates can be stated as the number of animals or as animal units — usually considered a 1,000-pound cow. If the number of head method is used, it is important to specify the livestock type (calves, yearlings, cows, bulls, etc.) and weight since different sized animals have different nutritional requirements and, thus, place a different amount of grazing pressure on the pasture. The animal unit method is useful when defining a stocking rate for livestock not necessarily intended for weight gain (beef cow/calf, horses, etc.).

Another factor to consider when determining the appropriate stocking rate is the forage species in the pasture and the time of year the livestock will be pastured. Tennessee is in a transition zone where cool-season grasses tend to dominate, but warm-season grasses can also thrive. Cool-season grasses, such as fescue, tend to produce their largest quantities of forage from the middle of April until the middle of June with a summer dormant stage. Forage production generally picks back up in late September when temperatures cool and lasts until late November when temperatures become too low to promote further growth. The majority of forage production from warm-season grasses, such as bermudagrass, occurs from the middle of June until the end of August when temperatures are very warm. Many pastures are mixed-grass pastures, but it is important to estimate the expected forage availability when determining stocking rates since it can influence the pounds of beef produced per acre and the integrity of the forage stand significantly.

In lease agreements, stocking rates are defined in one of three ways:

1. The average number of head or animal units during the lease period because total numbers may vary with births and deaths, and the weight of animals will change with time.
2. Animal days or animal unit days account for the changing number and size of animals grazing.
3. A maximum number of head or animal units stating the stocking rate can never exceed a certain rate at any one time.

Pasture leases also can be based on a per acre basis or a share of gain basis. These methods provide an incentive for the livestock owner to stock the pasture heavily, which may not always be in the best interest of the landowner if she/he desires to maintain pasture quality. Therefore, this rental arrangement method must be approached and used with caution to minimize potential disagreements.

Landowner and Livestock Owner Contributions

The contributions approach requires a financial proxy for both the landowner and the livestock owner to establish a pasture lease. Thus, an estimate of the landowner's cost and the livestock owner's net return can be calculated to formulate an equitable lease. A number of factors can influence contribution calculations from each party and, thus, the final lease agreement rate. Such considerations for the landowner may include the alternative use of the pasture (opportunity cost) and the cost of taxes, insurance, fence repair and maintenance.

Similarly, the livestock owner's willingness to pay is dependent on availability of pasture in the community, availability of facilities (corrals, loading chutes, etc.), reliability of water supply, labor for maintenance (fences, corrals, watering systems, etc.), distance from home farm, quantity of leasable acreage, and other services offered by the landowner.

Landowner's Cost Estimate

Following three general steps should provide a strong base in calculating the landowner's contributions to the enterprise:

1. Identify resources provided to the livestock owner.
2. Establish values for the resources (land, buildings, fence, interest, taxes, etc.).
3. Estimate the annual cost incurred by the landowner.

Land:

Land should be valued based on its current fair market value for agricultural purposes and not based on other uses. The annual land charge can be estimated using an opportunity interest rate and multiplying it by the land value (see Worksheet #1). The regional rent-to-value ratio (cash rent divided by the market value) can be used as a starting point for determining the return to land, because it is an indicator of the opportunity cost of not renting the land on a cash basis.

Rent-to-value ratios vary across regions so it is important to consult the latest rent-to-value report published by the U.S. Department of Agriculture National Agricultural Statistics Service (USDA NASS) to obtain the average ratio for the region. Rent-to-value ratios for pasture in Tennessee from 2006 to 2012 ranged from 0.53 to 0.57 percent (USDA NASS, 2013b).

Annualized costs associated with real estate taxes, land development, land improvements and conservation practices should be attributed to the landowner's contribution. Land improvements could include tree removal, reworking ponds, or replanting grass stands. Land development cost may not be calculated easily due to the long-term nature of land development projects, and total cost should not be expected to be recouped in the first year of a pasture lease agreement.

Facilities:

Fences, structures, barns, watering systems (ponds, wells, automatic waterers, etc.) and handling facilities used by the livestock owner should be considered as part of the

landowner's contribution. To calculate the landowner's contribution to the operation from facilities, place a fair market value on all facilities used by the livestock owner and calculate the ownership costs for the facilities. Any facilities on the farm not used by the livestock owner should not be considered as part of the landowner's contribution. Ownership costs on resources include depreciation, interest, repairs, taxes and insurance.

- Calculating depreciation requires estimating the remaining useful life, current fair market value and salvage value of the facilities. These values can be used to calculate the depreciation cost accrued to the landowner via the straight-line depreciation method or some other depreciation calculation. The facility's current value should be used in the depreciation calculation rather than its original value.
- Calculating interest costs associated with capital invested in facilities is necessary but is not meant to account for the actual interest payment on loans. One method of calculating the interest cost is to take the current interest rate on operating loans and multiply it by the average facility value. The average facility value can be calculated as:

$$\frac{\text{Total Investment Value} - \text{Salvage Value}}{\text{Average Facility Value} = 2}$$
 or half of the total investment value assuming no salvage value.
- Repairs, taxes and insurance are part of the landowner's contribution. The calculation of repair costs can sometimes be challenging. However, annual repair costs generally range from 1 to 3 percent of the average investment value, whereas taxes and insurance may range between 0.25 and 1 percent of the average investment value.

$$\frac{\text{Total Investment Value} - \text{Salvage Value}}{\text{Average Facility Value} = 2}$$

or half of the total investment value assuming no salvage value.

Worksheet #1. An Example of Landowner's Cost Calculations				
Land and Facility Investments	Agricultural Value		Acres	Useful Life
Land Value	\$600,000		200 (A)	
Fences	\$15,000			25
Corrals	\$			25
Other Investments	\$			25
Stocking Rate (acres/ head or animal unit)	2 (B)			
Item	Valuation		Rate	Annual Charge
Land Charges				
Interest	\$600,000 ×		0.5% =	\$3,000
Land Taxes	\$600,000 ×		0.5% =	\$3,000
Annual Land Development Costs				\$ -
Facility Charges				
Depreciation				\$ -
Interest	\$15,000 ×		4.0% =	\$600
Repairs	\$15,000 ×		1.0% =	\$150
Taxes	\$15,000 ×		0.5% =	\$75
Insurance	\$15,000 ×		0.0% =	\$ -
Other Contributions				
Fertilizer				\$ -
Labor and Management				\$ -
Total Pasture Ownership Charges				\$6,825 (C)
Landowner's Contribution - \$/ head or animal unit [C÷(A÷B)]				\$68.25
Landowner's Contribution - \$/ acre [C÷A]				\$34.13

Labor, Management and Other Costs:

Other costs include, but are not limited to, labor, management, fertilizer costs and weed control. Any cost associated with the livestock operation that accrues to the landowner should be considered in the rental rate negotiations.

An example worksheet is provided to demonstrate the landowner cost estimate. This worksheet may not account for every cost a landowner may incur during a given production year. It is important that this worksheet be used only as a guide and that the landowner "itemizes" his or her cost to calculate costs incurred on the particular piece of land correctly. In the example, land (200 acres) is valued at \$3,000 per acre, while the fencing is valued at \$15,000 with no additional investments. The total pasture ownership cost for the 200 acres is \$6,825. A stocking rate of 2 acres of pasture per head results in total landowner contribution of \$68.25 per head or \$34.13 per acre. This implies that the landowner would need to receive \$34.13 per acre for the pasture lease to recoup cost and meet the desired return to assets.

Livestock Owner's Net Return Estimate

An equitable lease should consider both the landowner's cost and the livestock owner's ability to pay. Estimating the livestock owner's ability to pay is dependent on expected net returns, which requires a solid grasp of both cost incurred and revenue generated. Livestock production budgets provide a starting point for estimating net returns. The budgets can be obtained from the UT Extension website. Production budgets provide a template for costs and revenues, which help ensure all costs of production are considered. While production budgets provide a starting point, the budgets are not all-inclusive; thus, it is important for each livestock owner to adjust budgets to reflect his/her specific circumstances. Only the livestock owner's costs and revenue should be included in the budget. This may require amending the budget template by adding or deleting revenue or cost items to reflect a more accurate net return estimate.

Livestock are generally marketed on a per head basis (\$/head) or by weight (\$/cwt.). Calculating the livestock owner's net return on a per head basis may be the most straightforward method. Net returns to grazing (\$/head) is defined as the final value of the animal leaving the pasture, less the initial value of the animal entering the pasture and the operating costs incurred during the leasing term.

Costs to consider include veterinary and medicine, labor, marketing, transportation and supplemental feed. Additionally, the livestock owner incurs ownership costs in the form of depreciation (in the case of breeding stock or dairy cows), interest, taxes and insurance because the animal placed on pasture is an investment.

- If animals are pastured for weight gain (i.e., stockers), then depreciation is not a cost. However, the value of the animals themselves is a cost.
- Similar to the interest cost incurred by the landowner, the livestock owner has an interest cost or opportunity cost associated with the cost of owning the livestock instead of investing money elsewhere. Interest costs should be charged even if money was not borrowed to purchase the livestock. Base the interest payment on the length of time the animals are on the pasture. For example, if the pasture is only grazed for four months out of the year, then the interest cost should only be calculated for one-third of the year.
- Taxes and insurance also should be accounted for in the livestock owner's budget. Similar to the interest cost, taxes and insurance costs should only be calculated for the time the animals are on pasture.

Finally, livestock owners should include death loss as a cost associated with livestock ownership. Death loss costs can be calculated by multiplying the purchase price by an estimated percentage of animals that die. After costs and returns to the livestock owner have been calculated, the final net return estimate can be used to gauge the livestock owner's relative contribution.

Net return calculations are more complex for breeding animals, dairy cows and recreational livestock than for animals intended for weight gain. Again, a good starting point is a livestock production budget. The production budget can help capture costs and revenues associated with the livestock enterprise in question. Costs may include breeding costs, livestock replacement costs and depreciation on breeding stock.

An example of the livestock owner's net return estimate is provided in Worksheet #2 for a stocker cattle operator. Similar to the landowner worksheet, the livestock owner's net return estimate worksheet may not be itemized in a manner that accounts for all costs incurred by an individual livestock owner. Thus, it is important that the worksheet only be used as a guide in the cost estimation process and that the livestock owner makes additions and deletions to the worksheet to better represent the true cost.

The stocker operator is purchasing 550-pound steers for \$160 per hundredweight and selling 800-pound animals for \$137 per hundredweight, resulting in a value of gain of \$216 per head. The livestock owner's cost, which is made up of the initial purchase cost of \$880 per head and the operating cost per head of \$163.05, totals \$1,043.05 per head. Subtracting the total cost from the final value of the animal results in a net return to grazing of \$52.95 per head. A stocking rate of 2 acres per head results in a return of \$26.48 per acre of leased pasture. Therefore, the livestock owner can afford to pay \$26.48 per acre to lease the pasture.

Worksheet #2. An Example of the Livestock Owner's Net Return Calculations					
	Weight (lbs./animal)		Value (\$/cwt.)		Value (\$/animal)
Final Value of Animal	800	×	\$1.37	=	\$1,096 (A)
Initial Value of Animal	550	×	\$1.60	=	\$ 880 (B)
Value of Gain [A-B]					\$ 216
Livestock Owner's Contribution	Units		Rate		Cost (\$/animal)
Time on Pasture (months)	4				
Interest [(A+B)÷2×C×(4÷12)]			7.0% (C)		\$20.53
Taxes, Vet, Insurance, Miscellaneous					\$30.00
Marketing [A×D]			2.0% (D)		\$21.92
Hauling					\$4.00
Death Loss [B×E]			2.0% (E)		\$17.60
Supplemental Feed					\$35.00
Labor (\$/hour)	2		\$12.00		\$24.00
Management					\$10.00
Livestock Owner's Operating Cost (\$/head)					\$163.05 (F)
Livestock Operating Cost and Initial Value - \$/head [B+F]					\$1,043.05 (G)
Net Returns to Grazing - \$/head [A-G]					\$52.95 (H)
Stocking Rate (acres/head)	2 (I)				
Livestock Owner Returns to Pasture - \$/acre [H÷I]					\$26.48

Establishing Lease Rates

Two common methods used to develop an acceptable lease rate include cash lease and share of gain. The contributions approach aids the negotiating process and the establishment of the lease rate method that provides a fair and equitable lease. Independent contribution calculations developed by the landowner and livestock owner allow both parties to identify and discuss disagreements of values placed on certain assets. This process can help identify the leasing method (cash lease or share of gain) that is most appropriate for both parties. The following is an example of how the contributions approach can be used to determine cash lease and share of gain.

Cash Lease

Using the landowner's and livestock owner's individualized contribution calculation from Worksheet #1 and Worksheet #2, respectively, as examples, the landowner would like to receive \$34.13 per acre, while the livestock owner would like to pay no more than \$26.48 per acre of pasture.

The discrepancy between the landowner's desired rental rate and the livestock owner's preferred rental rate leads to one of two outcomes. The two parties will negotiate a price that falls between \$26.48 and \$34.13 per acre, or they will not enter into a pasture lease agreement with each other. This assumes that both parties wish to cover all costs defined in the worksheets. When negotiating a cash rental rate, the parties should keep in mind that, in a cash lease, the landowner is protected from unexpected changes in the return to the livestock operation.

Thus, the landowner receives the same return regardless of whether the return to the livestock operation is higher or lower than expected. On the other hand, a lease rate based on the parties' share of gain allows both the landowner and the livestock owner to share the risk associated with the operation.

Share of Gain

If the landowner and the livestock owner decide to negotiate a pasture lease price, one way is to use the share of gain approach. The share of gain approach divides the value of the livestock gain between the landowner and the livestock owner based on their relative contributions. This approach is illustrated in Worksheet #3. To obtain each party's percent contribution, the estimated contribution for the landowner and the livestock owner per head found in Worksheet #1 and Worksheet #2, respectively, is divided by the total estimated contribution — \$231.30. Thus, the landowner's share is $\$68.25 / \$231.30 = 29.5\%$, and the livestock owner's share is $\$163.05 / \$231.30 = 70.5\%$. It is important that the contribution values for the landowner and the livestock owner be in the same units.

The percent contribution is then multiplied by the total value of gain (\$216.00 from Worksheet #2) to calculate the net return allocation for both parties (\$63.73 for the landowner and \$152.27 for the livestock owner). The landowner's net return allocation can then be divided by the stocking rate (2 head per acre in this example) to obtain the implied cash rental rate per acre ($\$63.73 \div 2 = \31.87). The share of gain approach requires the final value of gain. Thus, the actual rental rate is not known until the end of the lease. However, it is common for part of the rent payment to be paid earlier in the lease. The final payment then occurs at the end of the lease period when the value of gain is determined. Note that the implied cash rental rate falls between the individualized cash lease rates.

Other Factors to Consider When Establishing Lease Rates

Other factors to consider when establishing pasture lease rates include, but are not limited to, current market rates, location value, water and services provided by the landowner. Valuing the aforementioned factors may be difficult, but they are worth considering when negotiating an equitable lease rate because they all play a part in what a livestock owner is willing to pay as well as the minimum a landowner is willing to accept.

Landowners and renters often depend heavily on the market rate to help determine pasture rental rates. The market rate is based on leases negotiated between multiple parties within a region. This is a good approach, but it can become a bad approach if the landowner and livestock owner fail to compare "apples to apples" during the rental agreement process. Market rates report only the price paid/received and do not specify other factors influencing the pasture value. Therefore, it may be necessary to evaluate current weather conditions, livestock inventories, livestock prices and other economic factors when negotiating the current year's lease agreement. Market value information by county from previous years is available from USDA NASS (USDA NASS, 2013a).

Pasture location is an important aspect in the livestock owner's estimation of costs, especially if she/he is the one tending the animals. Pastures in close proximity to the livestock owner and pastures in close proximity to each other are more valuable to the livestock owner than pastures farther away and more spread out. One way of calculating location cost is by determining the cost of one trip to the pasture then multiplying it by the number of trips to and from the farm.

Water is a necessity in livestock production and must be made available to the livestock throughout the duration of the pasture lease. The location of water relative to the primary grazing sources can greatly influence livestock weight gain. It is beneficial to outline who is responsible for the cost of supplying water in case good quality water becomes limited or nonexistent.

Services provided by the landowner also affect rental rates. Landowner involvement may range from no involvement to fully caring for the livestock during the rental agreement. Therefore, it is important for her/his costs to be calculated and addressed when determining a pasture rental rate.

Conclusion

Many livestock producers lease pastureland to provide part of the feed needs of beef cattle, goats, horses and dairy cattle across Tennessee and the United States. Pasture leasing is a major component of many livestock producers' operations and can greatly affect the profitability and sustainability of the operation. Similarly, many landowners depend on the revenue from leasing land to cover daily living expenses. This publication uses the contributions approach to determine an equitable pasture lease arrangement and is not all-inclusive. As such, landowners and livestock owners should incorporate adjustments to this approach to fit their specific circumstances. An equitable lease should be developed and put in writing so that both the landowner and the livestock owner can avoid disagreements and to aid in resolving disagreements that can commonly occur in oral leases.

Worksheet 3. An Example of How to Calculate a Share of Gain Lease Agreement Using the Contribution Approach			
	Landowner	Livestock Owner	Total
Value of Gain - \$/head from Worksheet 2			\$216.00 (A)
Estimated Contribution - \$/head from Worksheets 1 and 2	\$68.25 (B) +	\$163.05 (C) =	\$231.30 (D)
Percent Contribution [B÷D] and [C÷D]	29.5% (E)	70.5% (F)	
Net Return Allocation - \$/head	\$63.73 (A×E)	\$152.27 (A×F)	
Stocking Rate - acres/head or animal unit			2 (G)
Implied Cash Rental Rate - \$/acre [E÷G]	\$31.87		

This publication provides management information and guidelines for landlords and tenants to follow when negotiating rental agreements for farmland in Tennessee. It is designed to help landlords and tenants structure a rental arrangement suited to their individual circumstances.

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