

generates an allocation summary and performs net return and risk analysis based on the information submitted.

FRA contains appendices for nutrient requirements and feedstuff composition for beef cattle and AUM equivalents for various livestock types. It is designed to account for differences in forage quality as well as quantity across forage resources and stored feed stuffs.

## Land Resource Section

When considering the value of land to lease, it is important to remember that more than just the value of the forage should be taken into account-the ability to utilize those forage resources should be carefully considered as well. FRA allows the user to account for the value of fencing, water, and property taxes in the land section. The tool also gives users the option of selecting one or more different types of land: native pasture, improved pasture, sub-irrigated and irrigated meadow, crop land, and hay land.

Consider the Goshen County XR Ranch* that leases 1,500 acres of native grass for 100 cow-calf pairs for 5 months, 500 Animal Unit Months (AUMs) total, at a rate of \$30/pair/month. We enter this information in the land section of the FRA tool under native range.

The tool allows for varying forage quality, accounted for by entering a percentage of TDN per AUM in this section as well. National Research Council (NRC) tables included in the tool help to estimate the value if it is not known. For this example we will assume an average of 65 percent.

The pasture lease rate is set at $\$ 10 /$ acre ( $\$ 3,000 /$ month for 5 months divided by 1,500 acres). Assume the lease includes 10 miles of perimeter and cross fencing installed new at $\$ 9,500$ per mile, with a useful life of 20 years, $\$ 250$ in labor expenses per year, and \$1,750 in machinery expenses. For the water resource section, we assume the lease has four stock water points, costing \$2,500 each installed, with labor, machinery, and other expenses of \$3,500 annually. Data entries are shown in the Table 1.

## FRA Tool Resource Allocation

FRA allows users to allocate returns and expenses based on the contributions each party makes to the overall arrangement. The XR Ranch provides the \$15,000 lease
Table 1. XR Ranch Land Resources: Native Range and Fence Resources

| NATIVE Rango |  | OTAL 0 |  |  | Averase 019 Total |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Descripion |  |  | $\begin{gathered} \text { Cost } \\ \text { per Acre } \end{gathered}$ | $\begin{gathered} \text { AUMs } \\ \text { per Acre } \end{gathered}$ | Average Percent-TDN | $\begin{gathered} \text { TOTALAL } \\ \text { Cost } \\ \text { ceryear } \end{gathered}$ |
| Native pasture lease (100 cow caf pairs) | 1.500 | 500 | \$10.00 | 0.3 | $65 \%$ | 15.000 |
|  |  |  |  | $\div$ |  |  |
|  |  |  |  | - |  | . |
|  |  |  |  | - |  | . |
|  |  |  |  | - |  | : |
|  |  |  |  | $\cdots$ |  | - |
|  |  |  |  | - |  | - |
|  |  |  |  | - |  | - |
|  |  |  |  | - |  | . |
|  |  |  |  | - |  | $\cdots$ |
|  | 1,500 | 500 | . | - | . | 15,000 |


| ENCE Rosources |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Descripition | $\begin{gathered} \text { Miles } \\ \text { of Fence } \end{gathered}$ | $\begin{gathered} \text { Cost } \\ \text { per Mile } \\ \text { Installed } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Total } \\ \text { Years of } \\ \text { Useful Lite } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Fence } \\ \text { Expenses } \\ \text { per Year } \\ \hline \end{gathered}$ | click a button below to enter other costs | $\begin{array}{c\|} \hline \text { FENCE } \\ \text { Annual Labor } \\ \text { Costs } \\ \hline \end{array}$ | TOTAL per year |
| Native pasture fence | 10 | S9.500 | 20 | S250 |  |  | 7.000 |
|  |  |  |  |  | - |  | . |
|  |  |  |  |  |  | 250 | - |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | - |
|  |  |  |  |  |  | FENCE | . |
|  |  |  |  |  |  |  | - |
|  |  |  |  |  |  | Equipment Costs | . |
|  |  |  |  |  |  | \$ 1,750 | : |
|  |  |  |  |  |  |  | . |
|  |  |  |  |  |  |  | $\div$ |
|  | 10 | - | . | 250 |  | 2,000 | 7,000 |

Page-2
payment and the landlord provides the fence, water, and labor expenses for the lease. On the allocation page of the tool we would separate these expenses (Table 2). The landlord's portion of the annual expenses total $\$ 10,500$. Note that the FRA also allows for taxes and other annual expenses to be included in the analysis; we did not list those in this example.

## Livestock Section

FRA allows users to account for
 breeding and market livestock separately, along with the associated expenses for each. We enter 100 head in the breeding livestock section with a value per head of $\$ 1,800$ and estimated 10 years of service. We also enter labor and machinery expenses for the livestock, incurred by the landlord totaling $\$ 500$ per year.

Table 2. XR Ranch Lease Cost and Return Allocation
 FRA is designed to account for changes in livestock inventory; for multiple groups of livestock and with differing values by group, if desired.

Next assume that the XR Ranch has the opportunity to lease a standing, damaged corn crop from the same landlord. This would involve 250 cow-calf pairs with 450 pound calves on 500 acres for 2.5 months. The ranch would wean the calves at one month. In the livestock section, we enter the 250 cows in the breeding livestock section, and use the market livestock section to account for the calves (Table 3).

## Stored Feed

FRA's stored feed section allows the user to account for any stored feed or supplements that are fed over the lease period. The XR Ranch will supplement the cattle on the standing corn lease with protein tubs. As with the livestock section, the tool allows for changes in inventory; in this example the ranch starts with 10 tubs at $\$ 95$ per unit and purchases 20 during the lease period along with a few additional expenses associated with handling the tubs.

Table 3. XR Ranch Livestock Resources Breeding and Market Livestock


## Summary and Risk Analysis

FRA generates a summary table showing the total net return, after entering all income and expenses associated with the lease arrangement. Allocating the costs associated with the corn lease to the XR Ranch and the expected revenues from the livestock, we see an estimated net return of $\$ 38,700$ to the XR ranch (Table 4). Conversely, the landlord can expect a net return of $\$ 54,500$ ( $\$ 65,000$ for the two leases minus the \$10,500 in expenses).

A unique feature of the FRA is the ability to account for the risk under each of these leases. A risk probability curve

Table 4. XR Ranch Net Return Analysis

| Resource Net Return Analysis Worksheet |  | Supplier \#1 | Supplie \#2 | Supplier \#3 | User \#1 | User \#2 | User \#3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | TOTAL | Landlord |  |  | XR Ranch |  |  |
| LAND Resource Net Return: | -\$76,902 | -\$10,500 | \$0 | \$0 | -\$66,402 | \$0 | \$0 |
| LIVESTOCK Resource Net Return: | \$106,456 | \$0 | \$0 | \$0 | \$106,456 | \$0 | \$0 |
| HOUSING Resource Net Return: | - | - | - | - | - |  |  |
| STORED FEED Resource Net Return: | -\$1,354 | \$0 | \$0 | \$0 | -\$1,354 | \$0 | \$0 |
| TOTAL Resource Net Return: | \$28,200 | -\$10,500 | \$0 | \$0 | \$38,700 | \$0 | \$0 |
| Total Resource Net Return Allocation: | 100\% | 21.3\% |  |  | 78.7\% |  |  |


| Net Return Analysis* |  | Supplier \#1 | Supplier \#2 | Supplier \#3 | User \#1 | User \#2 | User \#3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Net Return per YEAR | \$28,200 | -\$10,500 | \$0 | \$0 | \$38,700 | \$0 | \$0 |
| Net Return per ACRE | \$14.10 | -\$5.25 | \$0.00 | \$0.00 | \$19.35 | \$0.00 | \$0.00 |
| Net Return per ANIMAL | \$59.24 | -\$22.06 | \$0.00 | \$0.00 | \$81.30 | \$0.00 | \$0.00 |
| Net Return per POUND of AVAILABLE TDN | \$0.04 | -\$0.02 | \$0.00 | \$0.00 | \$0.06 | \$0.00 | \$0.00 |
| Net Return per ANIMAL UNIT MONTH | \$22.56 | -\$8.40 | \$0.00 | \$0.00 | \$30.96 | \$0.00 | \$0.00 |
| Net Return per ANIMAL UNIT | \$270.72 | -\$100.80 | \$0.00 | \$0.00 | \$371.52 | \$0.00 | \$0.00 |

* Net return analysis for suppliers and users allocated based on their relative share of total resource expenses per YEAR. can be generated for various risk factors: the user selects the factor and a maximum and minimum expected value.

The main concern for the XR Ranch is variability in AUMs available, depending on changing weather conditions. We enter 2,000 AUMs for a maximum value and 800 for a minimum, with 1,715 as the most likely value generated by the tool.

The resulting probability curve (Table 5) shows the net benefit to the XR Ranch ranging from \$14.40/AUM (\$18,000 total) to \$36.10/AUM (\$45,125 total), with a $50 / 50$ chance of earning \$29.60/AUM (\$37,000 total).

Table 5. XR Ranch Net Risk Analysis


* The XR Ranch is a case study example created to demonstrate RightRisk tools and their application. No identification with actual persons (living or deceased), places, or agricultural operation is intended nor should be inferred.

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Page -4

