

Farm Lease Calculator

User's Manual

Farm Lease Calculator is a spreadsheet used to evaluate, analyze, and determine crop production budgets and lease arrangements for the benefit of landowners and tenants.

Aaron C. Raymond
MBA-Agribusiness
University of Nebraska-Lincoln

Version 1.0
October, 2006



Introduction

Farm Lease Calculator is a Microsoft Excel spreadsheet used to evaluate, analyze, and determine crop production budgets and lease arrangements for the benefit of landowners and tenants. It is created in a means that makes the revenues, inputs, operations, contributions, etc. of crop production easy to assemble and analyze so that landowners and tenants can form lease arrangements that are fair and mutually beneficial to both parties.

The spreadsheet is comprised of 8 separate tabs: Intro, Inputs, Shares, Cash Summary, Cash Sensitivity, Share Summary, Share Sensitivity, and Data Sources. This manual will describe the spreadsheet in detail, by tab, to ensure the ease of use, and accuracy for the landowner and tenant. To print the tables within each of these tabs, one can go to the file menu and select print, or click on the print button in the upper right-hand corner of each page. It is important to remember that this spreadsheet is a budget, not a cash flow statement.

Intro Tab

The intro tab is essentially self-explanatory, and provides a basic and brief introduction of the spreadsheet and guide for its use.

Inputs Tab

The inputs tab is where all the data is entered for the production of the crop(s) produced on the leased cropland. All green cells are input cells. Enter the data specific to the cropland in these cells. All black numbers are calculations made automatically from the data entered in the green cells. The calculations are summarized per acre for each individual crop, by each individual expense, and the total for the rotation. The spreadsheet will only allow data to be entered in the green cells. This prevents the unintentional alteration of formulas, and ensures the accuracy of the spreadsheet. Some cells, usually the heading of the various inputs, will have a small red triangle in the upper right corner of the cell. When the mouse is held over these cells, a brief description of the input and how the data should be entered will be displayed. This is merely to assist the user as he/she enters the crop production data.

Landowner: Enter the information regarding the landowner.

Tenant: Enter the information regarding the tenant.

Field(s): Enter the field(s) this analysis applies to.

Note: Landowner, tenant, and field(s) entries are simply for reference and organization. They have no bearing on any calculations.

Crops:

Crops: Enter up to 4 crops to be analyzed/produced

Note: Crops that are grown under dryland and irrigated conditions should be kept separate, as the production data, methods, and expenses differ.

Total Acres: Enter the total acres planted to each crop. This number also serves to determine which crops to analyze. If zero or no number is entered, the crop will not show up in the summary or sensitivity tabs. This makes analyzing rotations and different crops easier, as only the total acres needs to be removed, instead of all the inputs of the crop.

Production Method: Enter the number that corresponds to the farming method. This is essentially a measure of farming intensity.

0.5 = double cropping of two crops in one year, such as wheat-soybeans

1.0 = continuous cropping of one crop per year, such as a corn-soybean rotation.

1.5 = ecofallow cropping of two crops every three years, such as a corn-wheat-fallow rotation.

2.0 = fallow cropping of one crop every two years, such as wheat-fallow rotation.

Note: If the crop production in this analysis includes a fallow method, include all the operations and expenses of the fallow year with the production year(s).

Table 1. Revenues:

Yield per Acre: Enter the anticipated crop yield per acre (bushels, tons, etc.).

Price per Unit: Enter the anticipated crop price received per unit (bushel, ton, etc.).

Net Gov't Payments per Acre: Enter the anticipated program or subsidy payments received per acre.

Table 2. Variable Expenses:

Seeding Rate: Enter the amount of seed planted per acre (seeds, pounds, bags, etc.)

Price per Unit: Enter the cost of seed per unit (seeds, pounds, bags, etc.)

Fertilizer, Herbicide, and Insecticide & Fungicide: Enter the various fertilizers, herbicides, insecticides, chemicals, etc. applied underneath each respective column. Under the crop, enter the amount applied per acre. Under \$/Unit, enter the cost of each input per unit. Under unit, enter the amount each input is measured in (pound, gallon, ounce, pint, etc.).

Crop Insurance: If used, enter the crop insurance premiums per acre.

Crop Consulting: If used, enter the crop consulting fees per acre.

Machinery/Field Operations: Enter all the field operations to produce the crop(s) under the machinery/field operations column. Under the crop, enter the number of operations per acre. Under \$/Unit, enter the variable cost of each operation per unit. Under unit, enter the amount each operation is measured in (acre, hour, etc.).

Note: Enter only the variable expenses associated with each operation. This would only include fuel, lube, repairs, and labor. The fixed expenses can be entered under table 3.

Custom Operations: If used, enter all custom operations used to produce the crop(s) per acre. The format is the same as the fertilizer, machinery, etc. expenses.

Irrigation: If used, enter the irrigation applied. Under the crop, enter the amount applied per acre. Under \$/Unit, enter the cost of irrigation per unit. Under unit, enter the units the irrigation is measured in (acre-inches, hours, etc.).

Note: This number also serves to determine which crops to allocate irrigation fixed expenses. If zero or no number is entered, then no irrigation expenses (neither variable nor fixed) will be applied to that crop. This is why it is important to keep dryland and irrigated crops separate.

Note: Enter only the variable costs associated with irrigation. This would include only fuel and lube. This is particularly important under a share lease, when irrigation fuel and lube expenses are often shared, but depreciation, insurance, etc. are not. The fixed expenses can be entered under table 3.

Labor/Management: Enter all labor and management used to produce the crop(s) per acre. The format is the same as the fertilizer, machinery, etc. expenses.

Drying, Storage, Transportation: Enter the drying, storage, and transportation costs. These are measured and calculated based on yield, not per acre. Under the crop, enter the amount applied. Under \$/Unit, enter the cost per unit. Under unit, enter the amount each function is measured in (points, months, bushels, etc.)

Cash Lease Rent: Enter the cash rent paid per acre under a cash lease rental arrangement.

Share Lease Rent: Enter the cash rent paid per acre under a share lease rental arrangement. This “cash boot” can be used in share leases to shore up differences in contributions, or in cash/share combination rental arrangements.

Table 3. Fixed Expenses:

Property Taxes: Enter the property taxes paid per acre.

Lime: If used, enter the lime applied per acre. The format is the same as the fertilizer, machinery etc. expenses.

Note: This expense is kept separate, as usually under a cash lease, only the landowner will incur this expense. However, if the tenant incurs the lime expense under a cash lease, simply enter the lime under the fertilizer or other appropriate expense table.

Machinery/Field Operations: All of the field operations, the number of operations, and the units entered above under the machinery/field operations variable expenses are automatically entered under the machinery/field operations fixed expenses. Under \$/Unit, enter the fixed cost of each operation per unit.

Note: Enter only the fixed expenses associated with each operation. This would include only depreciation, taxes, housing, insurance, and interest.

Irrigation Equipment: If used, enter the irrigation fixed expenses. Under investment, enter the total cost of each respective irrigation component (well, column, & gearhead, power unit, and the irrigation system). Under expected life, enter the number of years each component can be expected to function or last. Under salvage value, enter the percentage value of the investment each respective irrigation component would be worth after the expected life. Under overhead, enter the fixed expenses per year associated with each respective component. The ownership proportions of the various irrigation components, and the interest rate can be entered in table 4.

Note: Enter only the taxes, insurance, repairs, and maintenance under overhead. Often when the landowner owns the irrigation equipment, the arrangement will be the first \$250, \$500, etc. of irrigation repairs are to be incurred by the tenant, with the remainder being paid by the landlord. If this is the case, enter the amount incurred by the tenant under the machinery/field

operations or other appropriate expense table, and the remaining overhead under the irrigation overhead expense.

The interest expense is calculated automatically using the half-life method (investment expense, minus salvage value, divided by 2 and multiplied by the interest rate). The depreciation expense is also calculated automatically using the straight-line method (investment expense, minus salvage value, divided by the respective expected life).

Why can irrigation investment be entered, but not other machinery? Unlike the machinery/field operations, the irrigation investment data can be entered because the irrigation equipment is tied specifically to the acres in this analysis. For example, a center pivot can be depreciated only over the acres it can cover, usually about 130 acres. A tractor, however, can be depreciated over far more including acres outside of this analysis, often up to several thousand.

Table 4. Analysis & Other Inputs

Irrigation Equipment Ownership: If used, enter the tenant's share of ownership proportions of the various irrigation components.

Land Data: The land data is used to calculate the land contribution of the landowner in a share lease arrangement. One must only use the data for dryland, unimproved property, even if the land is irrigated. The added value from irrigated land will come in the form of the total fixed expenses of the irrigation equipment. Even if the land is dryland and has irrigation potential, the added land value from the irrigation potential cannot be included in that the added productivity from the irrigation has not actually been captured. Enter the approximate dryland, unimproved, land value that represents the productivity and market value of the land in this analysis under land value. Enter the approximate dryland, unimproved net rate of return expected from the land in this analysis under net rate of return. Both of these numbers vary widely throughout the state. A good source of information for determining these numbers, or a starting point for negotiations would be the UNL Nebraska Farm Real Estate Market Developments Survey. For convenience, the tables of these land values and net rates of return for the various regions of the state are found under the Data Sources tab. For a complete copy of the survey, go to <http://agecon.unl.edu/realestate/>

Cash Rent Data: Enter the proportion of the cash rent paid up-front, before the growing season under a cash lease arrangement. Operating interest will accrue on this portion, while no interest will be charged on the remaining amount paid after harvest.

Operating Loan Interest: Enter the operating loan interest rate, and the duration of the loan in months. The interest expense will accrue on all variable expenses at the rate and for the term entered.

Irrigation Loan Interest: If used, enter the irrigation equipment interest rate. This rate is used to calculate the irrigation interest expense.

Note: Because irrigation investments can be so substantial, the interest rate can grant an excessive contribution to the landowner. Use cautiously.

Shares Tab

The shares tab is where share percentages of the various crop revenues and expenses are entered under a share lease arrangement. The landowner, tenant, field(s), and crops are automatically brought over from the inputs tab. All green cells are input cells, and the only tenant's share should be entered. The landowner's share is the residual.

Table 5. Revenue Shares

Enter the tenant's respective share of crop yield, net government payments, and other income for each respective crop under a share lease arrangement.

Table 6. Variable Expenses Shares

Enter the tenant's respective share of seed, fertilizer, herbicide, insecticide & fungicide, crop insurance, crop consulting, machinery/field operations, custom operations, irrigation, labor/management, and drying, storage, and transportation variable expenses for each respective crop under a share lease arrangement.

Table 7. Fixed Expenses Shares

Enter the tenant's respective share of lime and machinery/field operations fixed expenses for each respective crop under a share lease arrangement.

Cash Summary Tab

The cash summary tab is the result of the data entered in the inputs tab, and provides a budget summary for both the landowner and tenant under a cash lease arrangement. The budgets are highlighted by crop, revenues, variable and fixed expenses, totals, and breakevens for each respective party with the landowner data under the blue headings, and tenant data under the tan headings. Data is summarized per acre by each individual crop, total for the entire rotation, and per acre for the rotation. The breakeven yields are at the price per unit entered, and the breakeven price is at the yield per acre entered.

Cash Sensitivity Tab

The cash sensitivity tab is the result of the data in the cash summary tab, and provides a sensitivity matrix of the tenant's revenue less variable costs, and revenue less total costs (per acre) under various yield and price outcomes. These outcomes are 10% and 25% above and below the respective price and yields in the cash summary tab. The matrices allow the tenant to see the returns under the various price and yield outcomes without having to enter and re-enter all the different prices and yields.

Share Summary Tab

The share summary tab is the result of the data entered in the inputs and shares tab, and provides a budget summary for both the landowner and tenant under a share lease arrangement. The budgets are highlighted by crop, revenues, variable and fixed expenses, totals, relative contributions, cash rent equivalent, and breakevens for each respective party with the landowner data under the blue headings, and the tenant data under the tan headings. Data is summarized per acre by each individual crop, total for the entire rotation, and per acre for the rotation. The breakeven yields are at the price per unit entered, and the breakeven price is at the yield per acre entered.

The basis for analyzing and negotiating equitable share lease arrangements is generally by relative contributions. Under the relative contribution method, each party provides his/her agreed upon share of the inputs. Additionally, the tenant provides the equipment, labor, and management, and the landowner provides the land. In this program, the relative contribution of the tenant is the sum of the variable and fixed expenses in proportion to the shares entered, which usually includes all the machinery/field operations, custom operations, and labor/management. The relative contribution of the landowner is the sum of the variable and fixed expenses in proportion to the shares entered plus the land contribution, which is the product of the land value and the net rate of return. The goal of the equitable share is to have the net contributions percentage equal the share of the revenue. The shares of each revenue, input, expense, can be adjusted and negotiated until both parties agree upon an arrangement.

Additionally, equivalent cash rents can also be used to analyze and negotiate share lease arrangements. The equivalent cash rent is calculated for the landowner by taking the revenue less total expenses under a share lease and adding the fixed expenses. The equivalent cash rent is calculated for the tenant by taking the revenue less total expenses, not including cash rent, under a cash lease and replacing the cash lease profit with the share lease profit. The difference in the two will be the equivalent cash rent. Both methods will result in the same number. Both methods can be used for evaluating, analyzing, and determining a fair and equitable share lease arrangement for both parties.

Share Sensitivity Tab

The share sensitivity tab is the result of the data in the share summary tab, and provides a sensitivity matrix of the tenant's and landowner's revenue less variable costs, revenue less total costs, and equivalent cash rent (per acre) under various yield and price outcomes. These outcomes are 10% and 25% above and below the respective price and yields in the share summary tab. The matrices allow the tenant and landowner to see the returns under the various price and yield outcomes without having to enter and re-enter all the different prices and yields.

Some slight variation may be seen in the landowner's and tenant's equivalent cash rent sensitivity matrices due to rounding as well as the changing yields and the resulting changes in drying, storage, trucking, etc. expenses.

Data Sources Tab

The data sources tab provides a reference point and examples for reported cash rental rates, land values, and rates of return for various regions of the state. These examples provide reliable data as well as starting points for negotiations. It also provides the websites and contact information for additional information relevant to this spreadsheet including Nebraska crop budgets, custom rates, and the Nebraska real estate series, among others.

Farm Lease Calculator was developed by:

Aaron C. Raymond
Agribusiness Graduate Student
University of Nebraska-Lincoln

Special thanks and sincere appreciation go to Bruce Johnson, Dennis Conley, Doug Jose, Lance Brown, and Dave Goeller for their generous advice, insight, and contributions to this project.

Special thanks also goes to Kevin C. Dhuyvetter and Terry L. Kastens, Extension Agricultural Economists of Kansas State University, as well as Gary D. Schnitkey of Farm Analysis Solution Tools (FAST) for their work and developments in the lease analysis field and providing a foundation for which this program was built.

For more information see:

<http://www.agmanager.info/>

<http://www.farmdoc.uiuc.edu/fasttools/index.asp>

For questions or inquiries contact Bruce Johnson at bjohnson2@unl.edu

Filename: Farm Lease Calculator -- User's Manual.doc
Directory: Q:\Raymond\Lease Programs\Farm Lease Calculator
Template: C:\Documents and Settings\fhdwasse\Application
Data\Microsoft\Templates\Normal.dot
Title: NU Lease
Subject:
Author: fh314stu1
Keywords:
Comments:
Creation Date: 9/11/2006 2:32:00 PM
Change Number: 166
Last Saved On: 10/2/2007 10:29:00 AM
Last Saved By: fhdwasse
Total Editing Time: 1,308 Minutes
Last Printed On: 10/2/2007 10:30:00 AM
As of Last Complete Printing
Number of Pages: 8
Number of Words: 2,879 (approx.)
Number of Characters: 16,415 (approx.)