



## **TAWC Resource Allocation Analyzer**

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**The *TAWC Resource Allocation Analyzer*** is an economic-based decision aid which utilizes economic variables provided by an individual agricultural producer to estimate options for cropping systems which maximize per acre profits, whether at field or farm level. Utilizing information such as expected commodity prices, water availability, and enterprise options, irrigated agricultural producers can view cropping options which maximize their net returns per acre while accounting for irrigation demands and revenue potential. This user-friendly aid is designed to provide the agronomic planning options to maintain profitability and sustainability in irrigated row crop agriculture.


To utilize the **TAWC Solutions Resource Analyzer** a User ID and Password must be created under **MY Account** in the Navigation menu. Once this is completed, log into the site and place the mouse cursor over **TAWC Tools** from the Navigation menu at top and a drop-down menu will appear with the following selections:

**TAWC ET**

**Resource Allocation**

To begin, move your cursor over **TAWC Tools** then, click on **Resource Allocation** as seen in Screen 1. This will take you to Screen 2.

## Screen 1



<a href="#">Home</a>	<a href="#">TAWC Tools</a>	<a href="#">Weather</a>	<a href="#">About</a>	<a href="#">My Account</a>	<a href="#">Logout</a>
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<a href="#">TAWC ET</a>
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**Welcome to the TAWC Beta Website**

The Texas Alliance for Water Conservation (TAWC) is a producer-led demonstration funded by the State of Texas through the Texas Water Development Board. Initial funding for this demonstration came through Senate Bill 1053 that was sponsored by Senator Robert Duncan.

The TAWC, partnered with the Texas Coalition for Sustainable Integrated Systems Research (TeCSIS) long-term integrated systems research at Texas Tech University, provides for research, demonstration, and implementation to reduce water use while ensuring the economic viability of agriculture in the Texas High Plains.

This Demonstration Project is overseen by a Board of Directors comprised of area producers from Hale and Floyd Counties in cooperation with scientists from Texas Tech University College of Agriculture and Natural Resources, Texas A&M Agrilife Research and Extension, USDA-ARS and NRCS, and the High Plains Underground Water District No. 1.


The **TAWC** program is intended to link research with on-farm demonstration sites that can demonstrate water savings and maintain profitability through use of alternative production systems, water saving technologies, and management tools that allow the producer to save water and remain profitable. As water continues to decline in the Ogallala Aquifer and policies are developed to limit agricultural water use, the ability of our producers to remain both productive and profitable requires closer cooperation between research and production systems and improved interaction and information exchange. This project is intended to bridge the gap between research and "real-world" agricultural production systems through a tighter coalition of researchers and producers and is intended to benefit our agricultural community by providing them with alternative strategies and decision aids that are useful and easily accessible.

**TAWC Solutions** is intended to provide a simple web-based management decision tool and an ET (evapotranspiration) tool that can aid in improved management decisions in the application of irrigation water. The tools on this site are evolving and through their use we hope to continue to improve and expand their capabilities to help secure the future of agriculture in the Texas High Plains.

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**Screen 2**



Home   TAWC Tools   Weather   About   My Account   Logout

### Resource Allocation Analyzer

**Production Site Parameters**

Field Acreage	Pumping Capacity	Water Budget	Pumping Cost	Pumping Season
120 [Acres]	400 [GPM]	24 [In]	\$ 9 [/Acre-Inch]	90 [Days]

**Crops to be Analyzed**

Crop Type	Contracted Acres	Maximum Yield	Irrigation Required	Production Cost	Expected Price
None ▾	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 [/Acre]	\$ 0 [/lb, bu]
None ▾	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 [/Acre]	\$ 0 [/lb, bu]
None ▾	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 [/Acre]	\$ 0 [/lb, bu]
None ▾	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 [/Acre]	\$ 0 [/lb, bu]
None ▾	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 [/Acre]	\$ 0 [/lb, bu]

Analyze   Clear Form

**Useful Information**  
[Introduction](#)  
[Background](#)

The Resource Allocation Analyzer is designed to estimate field level cropping options for irrigated land which maximize net returns per acre. This program designs acreage allotments, yield goals, and irrigation application rates in a manner which maximizes profit while utilizing the available irrigation water to its greatest potential.

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Screen 2 represents the platform of which the Resource Allocation Analyzer works from. This is the only input screen for the program. Default values appear for the Production Site Parameters but each field or cell can be modified if so desired. To start the process, select each production site parameter to fit the field or farm to analyze. For definitions of each parameter please refer to the definitions on page 6. With the Production Site Parameters set, choose 1 of 5 crops to analyze. A single crop or up to a maximum of 5 can be chosen for the analysis. An example of selecting corn and cotton is illustrated in Screen 3.

**Screen 3**

The screenshot shows the 'Resource Allocation Analyzer' web application. At the top, there is a navigation menu with links for Home, TAWC Tools, Weather, About, My Account, and Logout. The main content area is divided into two sections: 'Production Site Parameters' and 'Crops to be Analyzed'. The 'Production Site Parameters' section contains a table with input fields for Field Acreage (120), Pumping Capacity (400), Water Budget (12), Pumping Cost (\$ 9), and Pumping Season (90). The 'Crops to be Analyzed' section contains a table with input fields for Crop Type, Contracted Acres, Maximum Yield, Irrigation Required, Production Cost, and Expected Price. Below the tables are 'Analyze' and 'Clear Form' buttons. On the right side, there is a 'Useful Information' section with links for 'Introduction' and 'Background', and a paragraph of text describing the program's purpose. At the bottom, there is a copyright notice for © 2010 Texas Alliance for Water Conservation and a disclaimer.

**Resource Allocation Analyzer**

Production Site Parameters

Field Acreage	Pumping Capacity	Water Budget	Pumping Cost	Pumping Season
120 [Acres]	400 [GPM]	12 [In]	\$ 9 /[Acre-Inch]	90 [Days]

Crops to be Analyzed

Crop Type	Contracted Acres	Maximum Yield	Irrigation Required	Production Cost	Expected Price
Cotton	0 [Acres]	1500 [lb, bu]	18 [In]	\$ 500 /[Acre]	\$ .90 /[lb, bu]
Corn	0 [Acres]	250 [lb, bu]	22 [In]	\$ 500 /[Acre]	\$ 5 /[lb, bu]
None	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 /[Acre]	\$ 0 /[lb, bu]
None	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 /[Acre]	\$ 0 /[lb, bu]
None	0 [Acres]	0 [lb, bu]	0 [In]	\$ 0 /[Acre]	\$ 0 /[lb, bu]

Useful Information

[Introduction](#)  
[Background](#)

The Resource Allocation Analyzer is designed to estimate field level cropping options for irrigated land which maximize net returns per acre. This program designs acreage allotments, yield goals, and irrigation application rates in a manner which maximizes profit while utilizing the available irrigation water to its greatest potential.

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Screen 4 illustrates the output from analyzing the crops and field parameters chosen in screen 3. The Maximum Profit Scenario indicates that the entire 120 acre field could be planted to cotton, with a yield goal of 1441 lbs utilizing 13.9 acre inches of water. This option will produce the highest net returns for the field at \$88,884. The next three scenarios offer alternatives which can be compared against the maximum profit scenario. Definitions and descriptions of the output screen can be seen on Page 7. Utilizing the Back button at the bottom of the page, alternative runs can be conducted by adding or deleting crop chooses and varying the production site parameters.

## Screen 4

### Resource Allocation Analyzer

#### Maximum Profit Scenario

	Crop Acreage [Acres]	Irrigation [Inches]	Yield per Acre [lbs, bu]	Cost per Acre	Return per Acre	Return per Crop	Total Irrigation [Acre-Inches]	Reduced Irrigation Demand [Acre-Inches]	Weighted Net Return	Net Return
Cotton	120	13.9	1,441	\$557	\$741	\$88,884	1,669	491	\$741	\$88,884

#### Maximum Profit Scenario for Equal Acreage among crops not contracted

	Crop Acreage [Acres]	Irrigation [Inches]	Yield per Acre [lbs, bu]	Cost per Acre	Return per Acre	Return per Crop	Total Irrigation [Acre-Inches]	Reduced Irrigation Demand [Acre-Inches]	Weighted Net Return	Net Return
Cotton	60	13.9	1,441	\$557	\$741	\$44,442	1,773	627	\$686	\$82,304
Corn	60	15.7	234	\$540	\$631	\$37,862				

#### Alternative Scenario 1

	Crop Acreage [Acres]	Irrigation [Inches]	Yield per Acre [lbs, bu]	Cost per Acre	Return per Acre	Return per Crop	Total Irrigation [Acre-Inches]	Reduced Irrigation Demand [Acre-Inches]	Weighted Net Return	Net Return
Cotton	80	13.9	1,441	\$557	\$741	\$59,256	1,738	582	\$704	\$84,497
Corn	40	15.7	234	\$540	\$631	\$25,241				

#### Alternative Scenario 2

	Crop Acreage [Acres]	Irrigation [Inches]	Yield per Acre [lbs, bu]	Cost per Acre	Return per Acre	Return per Crop	Total Irrigation [Acre-Inches]	Reduced Irrigation Demand [Acre-Inches]	Weighted Net Return	Net Return
Cotton	61	13.9	1,441	\$557	\$741	\$45,183	1,771	625	\$687	\$82,413
Corn	59	15.7	234	\$540	\$631	\$37,231				

Back

## **Production Site Parameters and Input Value Descriptions**

**Field Acreage** - enter the amount of acres to be analyzed.

**Pumping Capacity** - enter the Gross Pumping Capacity at the delivery system. This value is estimated in gallons per minute or GPM.

**Water Budget** - select a water budget in acre inches as it applies to your particular field. This cell can be used to evaluate crop options under restricted water scenarios. The water budget is defaulted at 24 acre inches.

**Pumping Cost** - enter the per acre inch pumping cost for the field being analyzed.

**Pumping Season** - enter the typical length of irrigated days. This is used in conjunction with the Pumping Capacity to estimate the total amount of water that could be applied to the field.

**Crop Type** - choose from the pull down menu one of the five crops to be analyzed. (cotton, corn, sorghum, wheat, & sunflowers). A maximum of five crops can be analyzed.

**Contracted Acres** - enter an acreage value in this column only if you have contracted a crop by acres. The will produce solutions that must have at least as many acres for a crop as entered into this column. For example if entered 60 acres of contracted corn on a 120 acre pivot, then the solution will solve such that at least 60 acres of corn will be in production with the remaining water being allocated to another crop chosen.

**Maximum Yield** - enter the maximum yield for a chosen crop. This yield number should represent the realistic maximum yield which could be achieved on the field analyzed. For example, while genetics do allow for 2200 lbs of cotton to be produced, the field analyzed may have never produced more than 1500 lbs. In this case, 1500 lbs should be entered into the cell.

**Production Cost** - enter the total expenses incurred to produce the crop at the maximum yield, excluding pumping costs. Typically these expenses represent the total cash expenses such as seed, fertilizer, tillage operations, chemical applications, and other in field operations.

**Expected Price** - enter the price which is expected to be received upon selling or marketing the crop.

## **Output Definitions and Descriptions**

**Maximum Profit Scenario** – This result provides an optimal level of crops acres, irrigation levels, and yield goals which maximize the total net returns per acre. This outcome can be a single crop or a combination of several crops of chosen.

**Maximum Profit Scenario for Equal Acreage** – This scenario produces the optimal outcome for all of the crops selected in the input screen and divides them equally among the field or farm acres analyzed.

**Alternative Scenario 1** - This scenario presents the optimal chose of crop acreages, irrigation levels, and yield goals which maximize profit 5% below the true maximum.

**Alternative Scenario 1** - This scenario presents the optimal chose of crop acreages, irrigation levels, and yield goals which maximize profit 10% below the true maximum.

**Crop Acreage** – the optimal acres by crop which could be planted to maximize net returns.

**Irrigation** – the optimal amount of irrigation required to produce the yield goal generated.

**Yield Goal per Acre** – the yield goal which maximizes net returns at the given irrigation level.

**Cost per Acre** – the total per acre cost of production including irrigation, at the optimal yield goal and irrigation levels.

**Return per Acre** – the net return per acre per crop representing the total revenue less total expenses.

**Return per Crop** – the total net returns per crop summed over the optimal acreage

**Total Irrigation** – the total amount of optimal irrigation applied in acre-inches.

**Reduced Irrigation Demand** – the amount of irrigation water that was not applied by avoiding producing at the maximum yield but by producing at the optimal level of yield and irrigation which maximized returns.

**Weighted Net Return** - the weighted amount of returns per acre if multiple crops were within the optimal solution.

**Net Return** - the total net returns over the acreage analyzed.

We are continually striving to improve the accuracy, usability and performance of this program. Through your feedback and assistance we can be proactive in addressing the needs of the Texas High Plains. This program has been created through the efforts of many involved in this project including Texas Tech University, Texas A&M AgriLife Research and Extension, USDA-ARS/NRCS, High Plains Underground Water District No. 1, Producers of Hale and Floyd Counties and the Texas Water Development Board.

**We must work together to solve the growing issues faced by agriculture today and tomorrow because ‘Water is Our Future’.**

*Your questions and suggestions are both welcome and encouraged. Please see contact information located on the TAWC Solutions Home page under **About**.*