CROP WATER ALLOCATOR

A Planning Tool!

Jonathan Aguilar
Extension - Water Resource Engineer
K-State Southwest Research and Extension

Managing Extreme and Extended Drought on the Farm and Ranch
4H Bldg. Garden City, Kansas 9 January 2014

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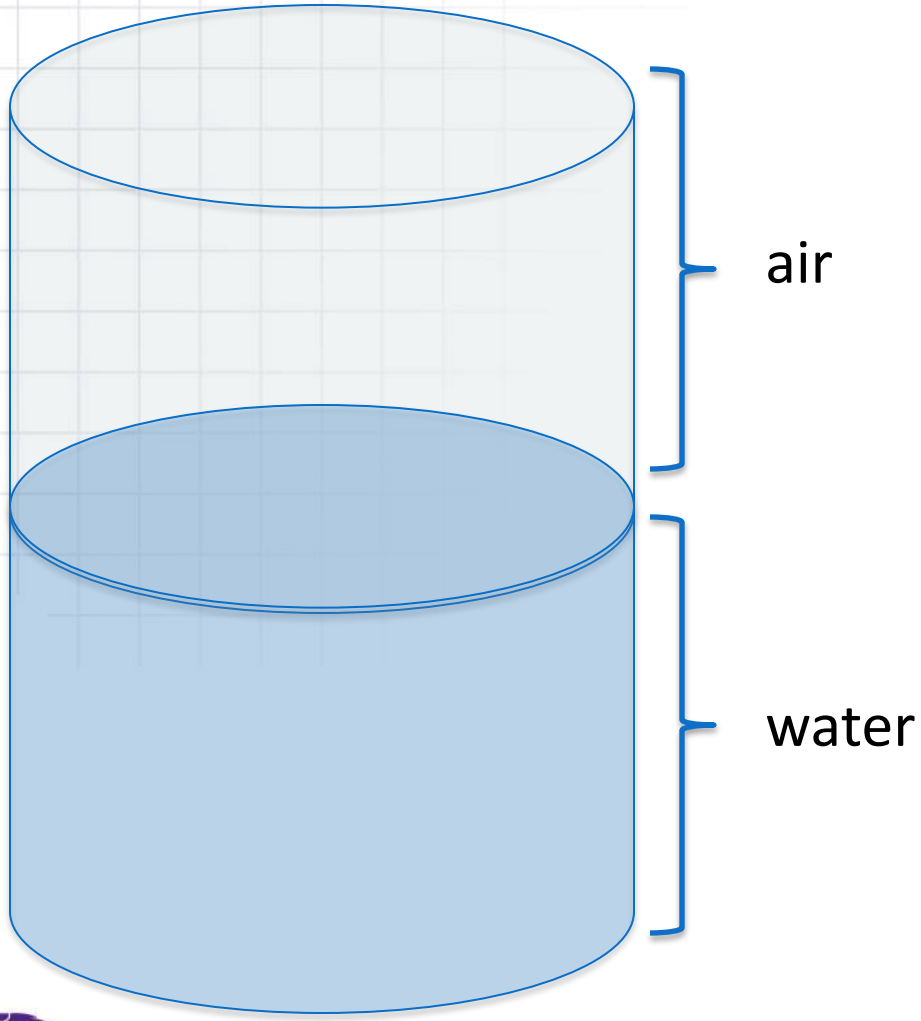
Knowledge for Life

Glass half full or empty?



For Engineers,

IT'S FULL!

They're in liquid and gaseous form!

Overview

- Backbone
- How to access
- Setting parameters
- Checking values
- Run and re-run
- Sample Scenarios
- Q&A

ACKNOWLEDGMENT

- Norman Klocke, (retired) Irrigation Engineer, Garden City
- Randall Currie, Weed Science, KSU, Garden City
- Loyd Stone, Soil Physics, KSU, Manhattan
- Troy Dumler, former Ag Economist, KSU, Garden City
- Danny Rogers, Irrigation Engineer, Manhattan
- Sprout Software, KC, MO

Supported by Ogallala Aquifer Program, a consortium between USDA-Agricultural Research Service, Kansas State University, Texas AgriLife Research, Texas AgriLife Extension Service, Texas Tech University, and West Texas A&M University

Tools and resources
for management and conservation

- **Crop Water Allocator** – pre-seasonal planning tool
- **Crop Yield Predictor** – in-season planning tool
- **KanSched** – daily decision tool

Crop Water Allocator

- Decision tool using Crop Production Functions
- Ideal for choosing crops and rotations to best utilize irrigation/available water based on net economic return to the producer
- Evaluates an array crop rotations and water allocations
- Net return = (Crop price X Crop Yield)
- – (Production Costs) – (Irrigation Costs)
- Income risk analysis

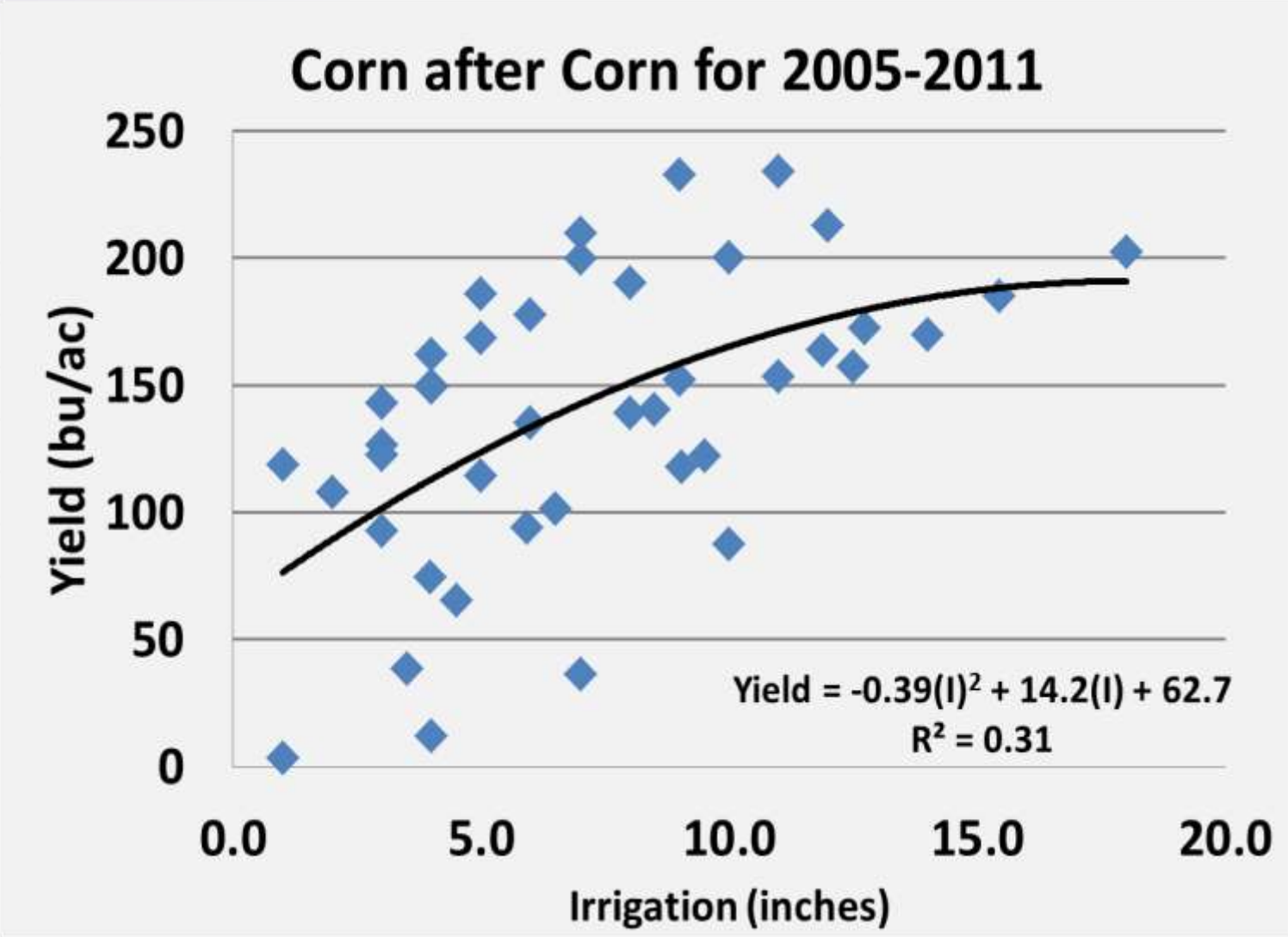
Crop Response to Irrigation
Garden City 2005-2011

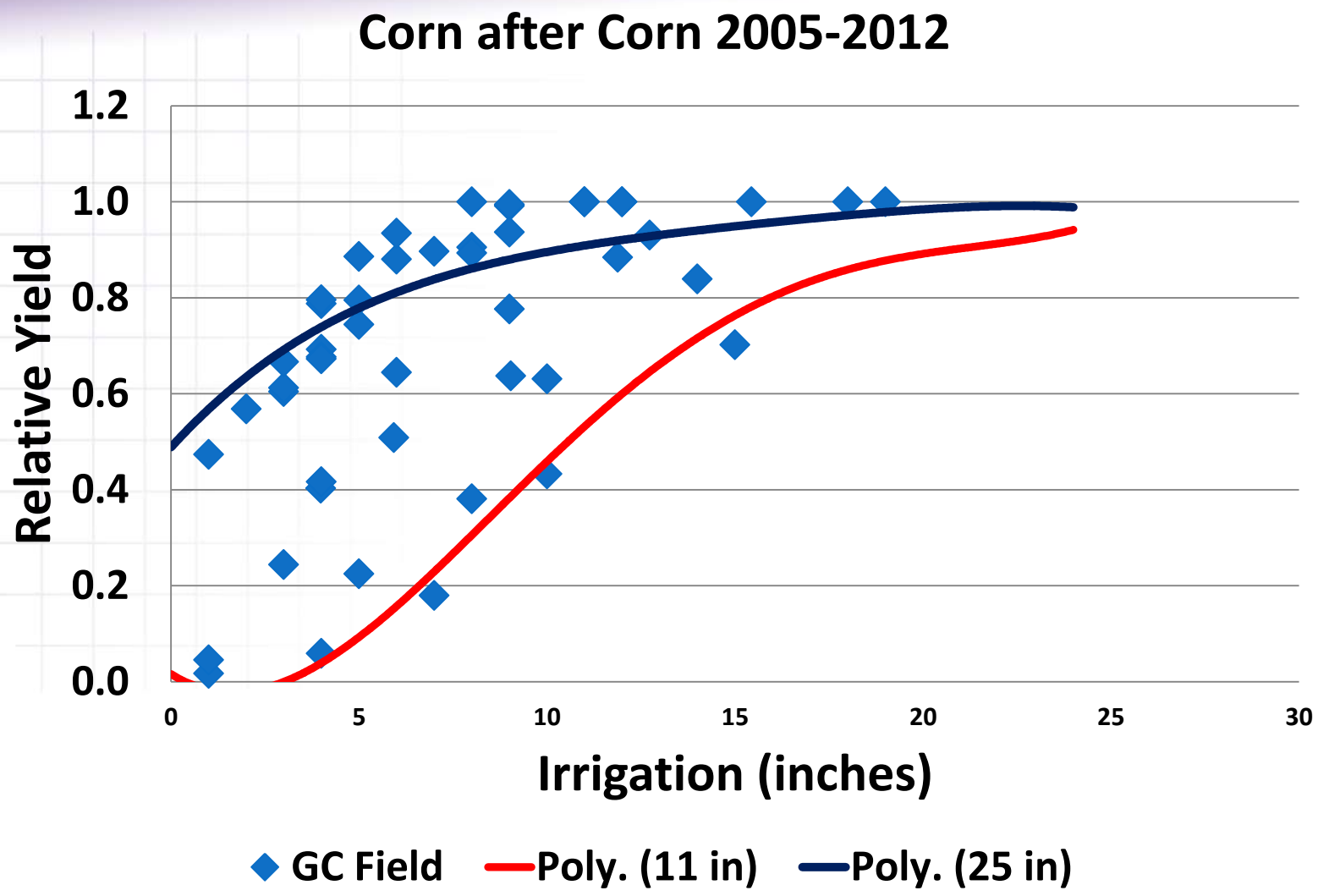
- Crop Sequence
  - Corn-Corn-Wheat-Sorghum-Sunflower
- Irrigation Treatments
  - Increase Days between Irrigations
  - Wet Plots Follow Wet Plots- Dry Follow Dry
- Results
  - Diminishing Return From Irrigation?
  - Yield Risk as Irrigation Decreases?
  - Yield vs. Irrigation Foundation for Economic Analysis

Irrigation Treatments Delineated By Days Between Irrigation Events With 1 inch Application During Each Event

Irrigation Treatment	Irrigation Interval (days)	Total Irr. (in)	% of Full Irrigation
1	5	13	100
2	6	10	80
3	7	8	60
4	10	6	45
5	13	4	30
6	19	2	15

Corn after Corn with No-till Management


Corn after Corn for 2005-2011
250
200
150
100
50
0
Yield (bu/ac)
0.0
5.0
10.0
15.0
20.0
Irrigation (inches)
Yield = -0.39(I)² + 14.2(I) + 62.7
R² = 0.31



Relative Yield = (Yield)/(Maximum Yield) For Each Year

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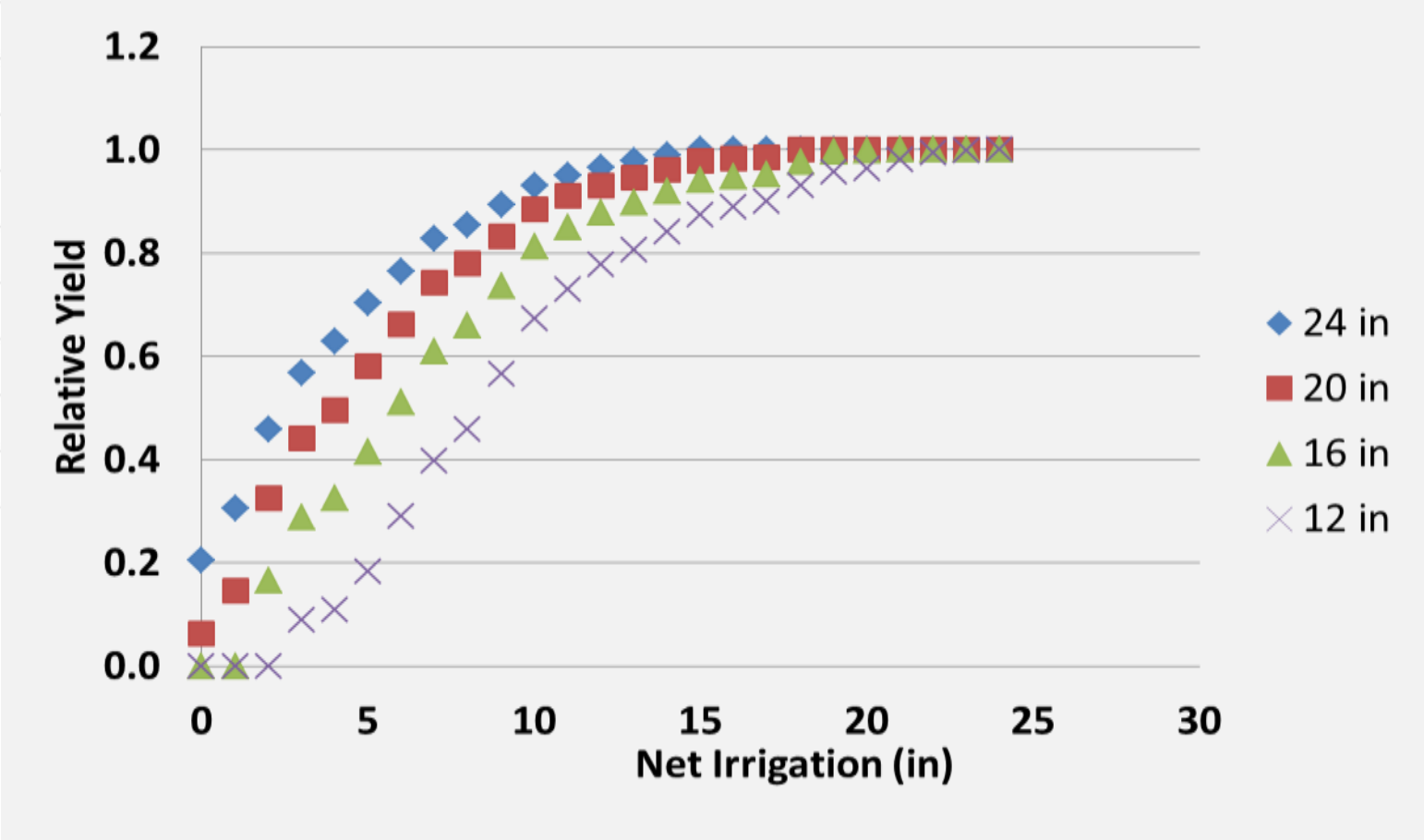
Crop Water Allocator for Corn
Relative Yield vs. Net Irrigation



Net Return = Rel. Yield X Max. Yield X Price – Operating Costs

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Kansas Water Budget

Reference ET

(Kc)

Maximum ET

(Ks)

Actual ET

(Crop Stress)

Effective ET

(Y-ET)

Yield

Soil Water Balance

Available SW

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General Flow

Start CWA

- Online version recommended

Input Field and Irrigation Info

- Check all values and fill-in the latest information available

Select Crop and Input Production Info

- Check the crops you intend to plant and supply all the latest information available

Calculate and Compare

- Press calculate and compare the results. Re-calculate using other parameters if needed

Accessing the CWA

- **Mobile Irrigation Laboratory**

Direct

mobileirrigationlab.com

Indirect

southwest.ksu.edu /irrigation & water mgt.

Crop Water Allocato ×

mobileirrigationlab.com/crop-water-allocator

Mobile Irrigation Lab

K·STATE Research and Extension

Home | Resources | Goals of the MIL | Software | Online Tools | The MIL Team | Contact Us

Software

- NWREC ET
- KanSched2
- KanSched3
- **Crop Water Allocator**
- Crop Yield Predictor
- KanSched for Excel
- FuelCost
- Pocket PC Software
- Quiz Master

Home › Resources › Software › Crop Water Allocator ›

Crop Water Allocator

CROP WATER ALLOCATOR

Many irrigators are facing challenges because of declining water yields from their wells. To optimize water applications with reduced irrigation capacity, irrigators are considering shifts in cropping patterns. Irrigators who have declining well capacities, need to know what crop combinations would most likely result in the most net return. This may require them need to allocate both land and water to multiple crops. With powerful personal computers common to consumers in the recent years, producers can evaluate different crop mixes to determine the most probable best allocation of resource by the use of compter models, such as the Crop Water Allocator (CWA). Personal computers have the capability to solve iterative approaches to complex questions. The CWA is a seasonal planning tool to find the optimum net return from all of the combinations of crops, irrigation amounts, and land allocations that the program user wants to examine.

Online Version

http://www.mobileirrigationlab.com/cwa2

Downloads

Crop Water Allocator v1.16 - Software and Documentation
cwa-setup-1.16.exe **1.64 MB**

Crop Water Allocator Reference Manuscript
cwa.pdf **158.9 KB**

Search

Search

Software Links

- NWREC ET
- KanSched2
- KanSched3
- **Crop Water Allocator**
- Crop Yield Predictor
- KanSched for Excel
- FuelCost
- Pocket PC Software
- Quiz Master

Online Tools

- Compare Energy Costs
- FuelCost Online

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CROP WATER ALLOCATOR
Help
Tips for navigating CWA
The Crop Water Allocator (CWA) is a tool to evaluate strategies to allocate limited irrigation on selected crops based on economic returns. It was developed by Kansas State University's Southwest Research-Extension Center, Department of Agronomy, and Department of Biological and Agricultural Engineering with programming support from Sprout Software, Kansas City, MO. The project was funded in part by the Ogallala Aquifer Program, a consortium of the USDA Agricultural Research Service, Kansas State University, Texas AgriLife Research, Texas AgriLife Extension Service, Texas Tech University, and West Texas A&M University.
Neither the programmers nor Kansas State University are to be held responsible for the information generated from this program.
Start
K·STATE
close

Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields

Field and Location Information

Acres	130	Soil type	Fine Sand	Annual Rainfall	14 inches
Applied Irrigation	18 inches	Land Split	100		

Irrigation Information

Discharge Rate	600 GPM	Season Pumping	2500 hrs	Pumping Lift	200 ft
				Well-head Pressure	35 psi
Efficiency	90 %	Fuel Type	Diesel	Fuel	$ 4.25 /gal
Labor	$ 10 per hour	Repairs & Maint	0.33 per ac-in		

Load Defaults

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would apply 23 inches of water in a season

Irrigation Costs Subtotal
$11.24/ac-in
*not including labor costs

Crop Water Allocator | About | Contact | Help

Show only unique crop combinations

Calculate

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Field and Irrigation | Crops, Prices, Yields

Field and Location Information

Acres 130 | Soil type Fine Sand | Annual Rainfall 14 inches

Applied Irrigation 18 inches

Applied / Gross Irrigation

0 – 28 inches

Irrigation Informati

Discharge Rate 600 GPM | Pumping Lift 200 ft | Load Defaults

Well-head Pressure 35 psi

Efficiency 90 % | Fuel Type Diesel | Fuel $ 4.25 /gal

Labor $ 10 per hour | Repairs & Maint 0.33 per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would apply 23 inches of water in a season

Irrigation Costs Subtotal
$11.24/ac-in
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Field and Irrigation | Crops, Prices, Yields

Field and Location Information

Acres 130

Soil type Fine Sand

Applied Irrigation 18 inches

Land Split 100

Irrigation Information

Discharge Rate 600 GPM

Season Pumping 2500 hrs

Load Defaults

Efficiency 90 %

Fuel Type Diesel

Fuel $ 4.25 /gal

Labor $ 10 per hour

Repairs & Maint 0.33 per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would apply 23 inches of water in a season

Irrigation Costs Subtotal
$11.24/ac-in
*not including labor costs

Soil Type	ASW
Silt Loam	2.4 in
Loamy Sand	1.3 in
Fine Sand	0.9 in

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Field and Irrigation | Crops, Prices, Yields

Field and Location Information

Acres 130 | Soil type Fine Sand | Annual Rainfall 14 inches

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Irrigation Costs Subtotal
$11.24/ac-in
*not including labor costs

Land Splits – Predetermined

100%
50% - 50%
75% - 25%
33% - 33% - 33%
50% - 25% - 25%
25% - 25% - 25% - 25%

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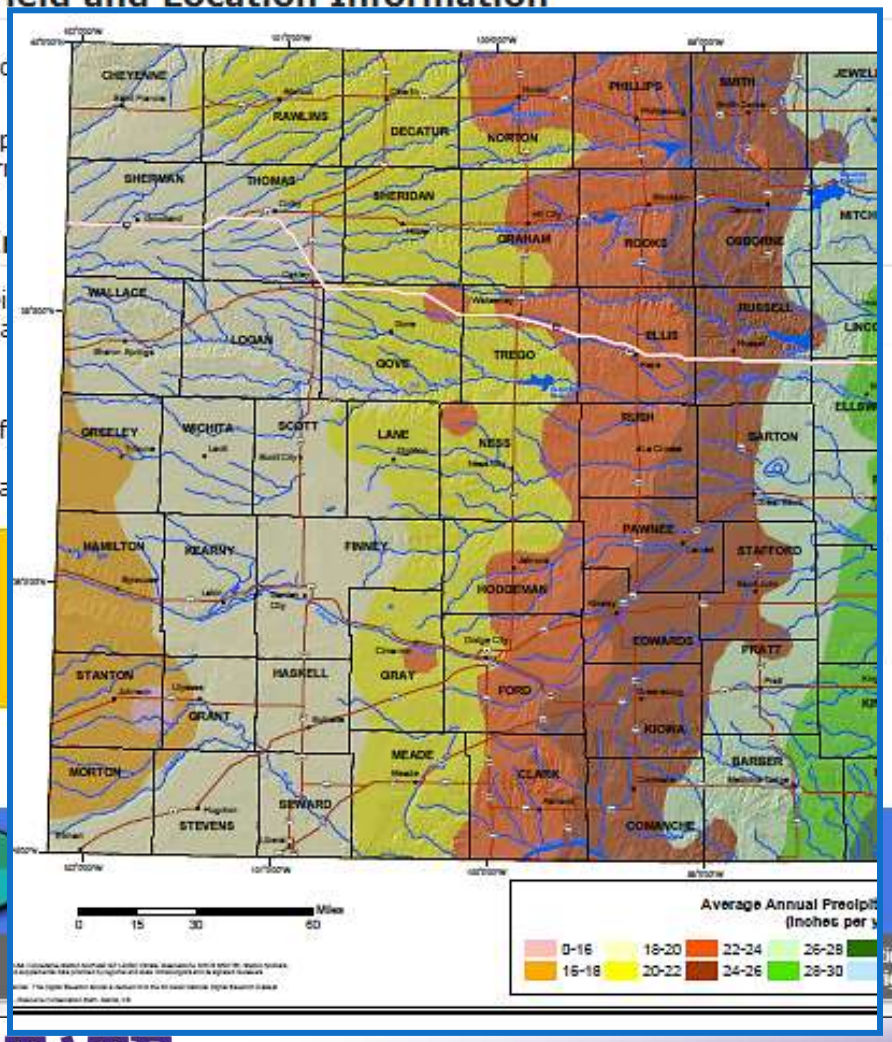
Field and Irrigation | Crops, Prices, Yields

Field and Location Information



Annual Rainfall 14 inches

Annual Rainfall

11 - 24 inches

Pumping Lift 200 ft

Load Defaults

Well-head Pressure 35 psi

Fuel $ 4.25 /gal

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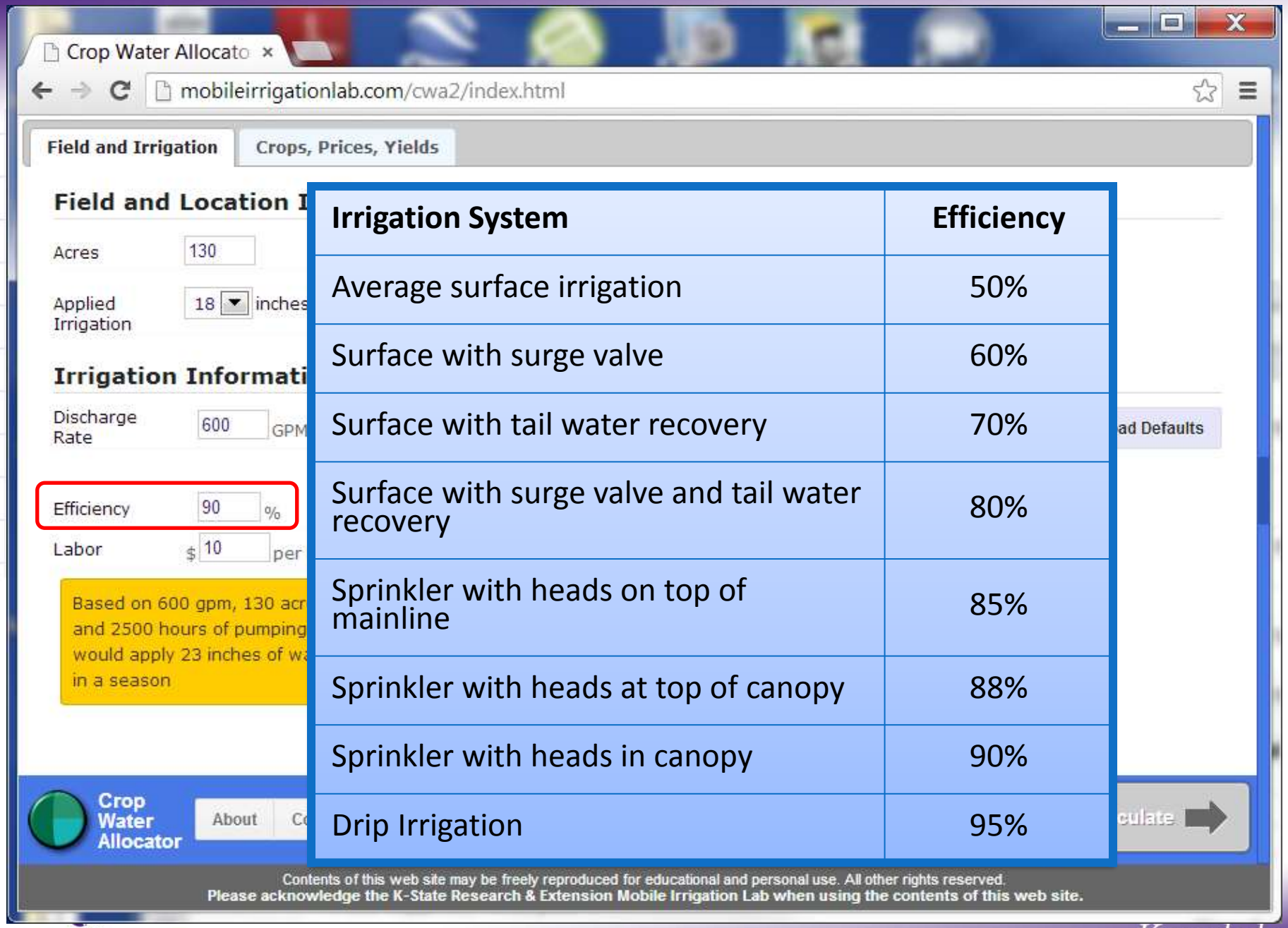

Irrigation System	Efficiency
Average surface irrigation	50%
Surface with surge valve	60%
Surface with tail water recovery	70%
Surface with surge valve and tail water recovery	80%
Sprinkler with heads on top of mainline	85%
Sprinkler with heads at top of canopy	88%
Sprinkler with heads in canopy	90%
Drip Irrigation	95%

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Field and Irrigation | Crops, Prices, Yields

Field and Location Information

Acres 130

Soil type Fine Sand

Annual Rainfall 14 inches

Applied Irrigation 18 inches

Land Split 100

Irrigation Information

Discharge Rate

Efficiency

Labor

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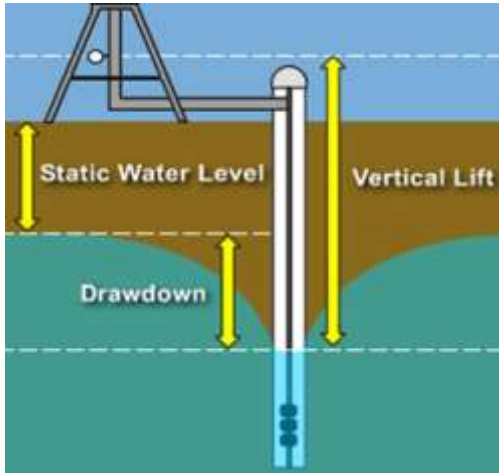
Pumping / Vertical Lift



Pumping Lift 200 ft

Well-head Pressure 35 psi

Fuel $ 4.25 /gal

Load Defaults

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Field and Irrigation | Crops, Prices, Yields

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Irrigation Information

Discharge Rate 600 GPM | Season Pumping 2500 hrs | Pumping Lift 200 ft | Load Defaults

Well-head Pressure 35 psi

Efficiency 90 % | Fuel Type Diesel | Fuel $ 4.25 /gal

Labor $ 10 per hour

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would apply 23 inches of water in a season

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Fuel Type

Diesel	**$/gallon**
Propane	**$/gallon**
Natural Gas	**$/mcf (thousand cubic ft)**
Electricity	**$/kWh (kilowatt-hour)**

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Field and Irrigation | Crops, Prices, Yields

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Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would apply 23 inches of water in a season

Irrigation Costs Subtotal
$11.24/ac-in
*not including labor costs

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Crop Water Allocator

Field and Irrigation | Crops, Prices, Yields

Load Defaults

	Price per unit:		Maximum Yield / Acre	
☐ Alfalfa	120	$/ton	9	tons
☐ Corn	6.52	$/bu.	220	bushels
☐ Sorghum	5.75	$/bu.	140	bushels
☐ Soybean	10.22	$/bu.	65	bushels
☐ Sunflower	0.2	$/lb.	3500	pounds
☐ Wheat	6.2	$/bu.	70	bushels
☐ (fallow)				

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Load Defaults

	Price per unit:		Maximum Yield / Acre	
☑ Alfalfa	120	$/ton	9	tons
☑ Corn	6.52	$/bu.	220	bushels
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☑ Sunflower	0.2	$/lb.	3500	pounds
☑ Wheat	6.2	$/bu.	70	bushels
☑ (fallow)				

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa

Alfalfa

Life of Alfalfa Stand 3 years

Load Defaults

General Input Costs

Use optimal

Nitrogen	0	lb/ac ☑	$ 0.44	/lb
Phosphorus	14.88	lb/ac ☑	$ 0.8	/lb
Seed	3	lb/ac ☑	$ 4	/lb
Herbicide	$ 20.01	/acre		
Insecticide	$ 7.45	/acre		

Subtotal $27.46/acre

*Not including nitrogen, phosphorus, seed

Operation Costs

Tillage	$ 31.26	/acre
Planting	$ 14.36	/acre
Fertilizer Appl	$ 5.12	/acre
Insecticide Appl	$ 5.24	/acre
Herbicide Appl	$ 5.26	/acre

Harvesting Costs

○ Itemized ◉ Flat Rate

Flat rate $ 35 /ton

Subtotal $61.24/acre

*Not including harvesting costs

Additional Returns and Costs

Misc Returns	$ 0	/acre
Misc Costs	$ 0	/acre

General Input Costs

Use optimal

Nitrogen	0	lb/ac ☐	$ 0.44	/lb
Phosphorus	14.88	lb/ac ☐	$ 0.8	/lb
Seed	3	lb/ac ☐	$ 4	/lb

Harvesting Costs

◉ Itemized ○ Flat Rate

		# of Operations
Swathing	$ 12.5 /acre	
Sideraking	$ 4.54 /acre	
Baling	$ 16.5 /bale	

Subtotal $61.24/acre

*Not including harvesting costs

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ALFALFA Optimal Seeding Rate	
Net Irrigation	**Seeding Rate**
0 through 36 in	3 lbs./ acre

Farm Management Guide MF-584

Center-Pivot-Irrigated Alfalfa Cost-Return Budget in Western Kansas

Department of Agricultural Economics — www.agmanager.info

K-STATE Research and Extension

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy J. Dumler, Agricultural Economist — Daniel M. O'Brien, Agricultural Economist

Markets for alfalfa hay are firmly established in western Kansas where sizable cattle feeding and expanding dairy operations provide a ready demand. Additionally, alfalfa hay and pellets produced in the region are routinely shipped to other areas. Perhaps in alfalfa, as in no other western Kansas crop enterprise, the timely and effective management of harvesting, handling, storage, and marketing operations is rewarded with higher hay quality and selling prices. Under good management, alfalfa can be as, or more, profitable than corn or other irrigated crops.

Income Per Acre

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budgets include three different yield levels, which are intended to represent expected yields for land of varying quality for a given level of management. Producers can compare the profitability of crop enterprises on farmland tracts with varying yield potential by considering alternative expected yield scenarios. Land values and government payments have been adjusted for alternative yield levels in this budget. In customizing a budget to your farm, attention should be given to using land values representative of your farm's productive capacity and local farmland market conditions.

Price per ton is based on the average Kansas Agricultural Statistics prices from May through July 2001.

Table 1. *Production Inputs — Center-Pivot-Irrigated Alfalfa**

Item	Yield Level (tons/a) 5.0	7.0	9.0	
Seed, lbs	3	3	3	$4.43/lb
Fertilizer:				
N (anhydrous)	0	0	0	$0.47/lb
N	0	0	0	$0.65/lb
P	81	116	150	$0.60/lb
K	0	0	0	$0.51/lb
Lime	0	0	0	$0.01/lb
Herbicide				
Velpar	1.0	1.0	1.0	$20.90/qt
Insecticide / Fungicide				
Warrior 1 EC	0.03	0.03	0.03	$226.17/lb
Irrigation water, in	14	19	24	$2.75/in

*Inputs represent annualized amounts over the 3-year stand.

Table 2. *Machinery and Land Resources — Center-Pivot-Irrigated Alfalfa**

Item	Yield Level (tons/a) 5.0	7.0	9.0	Custom Rate
Tillage/Planting/Chemical Applications:				

MF-584 Alfalfa, Center-Pivot, Western

http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp

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mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Corn

Corn

Load Defaults

General Input Costs

		Use optimal	
Nitrogen	1.35 lb/ac	☑	$ 0.44 /lb
Phosphorus	0.43 lb/ac	☑	$ 0.8 /lb
Seed	32000 seeds/ac	☑	$ 2.89 /1000 seeds

Herbicide $ 30 /acre

Insecticide $ 36.48 /acre

Subtotal $66.48/acre
*Not including nitrogen, phosphorus, seed

Operation Costs

Tillage	$ 31.26	/acre
Planting	$ 13.48	/acre
Fertilizer Appl	$ 5.12	/acre
Insecticide Appl	$ 5.24	/acre
Herbicide Appl	$ 5.26	/acre

Harvesting Costs

◉ Itemized ○ Flat Rate

Base Charge	$ 28.58	/acre
Extra charge for yields exceeding 74 bushels	$ 0.214	/bu.
Hauling	$ 0.197	/bu.

Subtotal $60.36/acre
*Not including harvesting costs

Additional Returns and Costs

Misc Returns $ 0 /acre

Misc Costs $ 0 /acre

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CORN Optimal Seeding Rate

Net Irrigation	Seeding Rate
18 in. and over	32,000 seeds / acre
15 - 17 in.	29,000 seeds / acre
12 - 14 in.	26,000 seeds / acre
9 - 11 in.	23,000 seeds / acre
6 - 8 in.	20,000 seeds / acre
0 - 5 in.	17,000 seeds / acre

Farm Management Guide MF-585

Center-Pivot-Irrigated Corn
Cost-Return Budget in Western Kansas

K·STATE Research and Extension

Department of Agricultural Economics — www.agmanager.info

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy J. Dumler, Agricultural Economist
Daniel M. O'Brien, Agricultural Economist

MF-585 Corn, Center-Pivot, Western
http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp

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mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Sorghum

Sorghum

General Input Costs

Use optimal

Nitrogen	167.00 lb/ac	☑	$ 0.44 /lb
Phosphorus	58.78 lb/ac	☑	$ 0.8 /lb
Seed	7.81 lb/ac	☑	$ 3.43 /lb
Herbicide	$ 26.56 /acre		
Insecticide	$ 0 /acre		

Subtotal $26.56/acre
*Not including nitrogen, phosphorus, seed

Operation Costs

Load Defaults

Tillage	$ 31.26 /acre
Planting	$ 13.8 /acre
Fertilizer Appl	$ 5.12 /acre
Insecticide Appl	$ 5.24 /acre
Herbicide Appl	$ 5.26 /acre

Harvesting Costs

◉ Itemized ○ Flat Rate

Base Charge	$ 25.67 /acre
Extra charge for yields exceeding 36 bushels	$ 0.24 /bu.
Hauling	$ 0.22 /bu.

Subtotal $60.68/acre
*Not including harvesting costs

Additional Returns and Costs

Misc Returns	$ 0.00 /acre
Misc Costs	$ 0.00 /acre

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Grain SORGHUM Optimal Seeding Rate

Net Irrigation	Seeding Rate
18 in. and over	32,000 seeds / acre
15 - 17 in.	29,000 seeds / acre
12 - 14 in.	26,000 seeds / acre
9 - 11 in.	23,000 seeds / acre
6 - 8 in.	20,000 seeds / acre
0 - 5 in.	17,000 seeds / acre

Farm Management Guide MF-582

Center-Pivot-Irrigated Grain Sorghum Cost-Return Budget in Western Kansas

Department of Agricultural Economics — www.agmanager.info

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Daniel M. O'Brien, Agricultural Economist

MF-582 Grain Sorghum, Center-Pivot, Western
http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp

Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Soybean

Soybean

Load Defaults

General Input Costs

		Use optimal	
Nitrogen	0 lb/ac	☑	$ 0.44 /lb
Phosphorus	0.87 lb/ac	☑	$ 0.8 /lb
Seed	200000 seeds/ac	☑	$ 0.31 /1000 seeds

Herbicide $ 26.19 /acre

Insecticide $ 0 /acre

Subtotal $26.19/acre
*Not including nitrogen, phosphorus, seed

Operation Costs

Tillage	$ 31.26	/acre
Planting	$ 13.77	/acre
Fertilizer Appl	$ 5.12	/acre
Insecticide Appl	$ 0	/acre
Herbicide Appl	$ 5.26	/acre

Harvesting Costs

◉ Itemized ○ Flat Rate

Base Charge	$ 28.37	/acre
Extra charge for yields exceeding 28 bushels	$ 0.23	/bu.
Hauling	$ 0.2	/bu.

Subtotal $55.41/acre
*Not including harvesting costs

Additional Returns and Costs

Misc Returns $ 0 /acre

Misc Costs $ 0 /acre

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SOYBEAN Optimal Seeding Rate

Net Irrigation	Seeding Rate
18 in. and over	200,000 seeds / acre
15 - 17 in.	185,000 seeds / acre
12 - 14 in.	170,000 seeds / acre
9 - 11 in.	155,000 seeds / acre
6 - 8 in.	140,000 seeds / acre
0 - 5 in.	125,000 seeds / acre

Farm Management Guide MF-586

Center-Pivot-Irrigated Soybean Cost-Return Budget in Western Kansas

K·STATE Research and Extension

Department of Agricultural Economics — www.agmanager.info

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy I. Dumler Daniel M. O'Brien

MF-586 Soybean, Center-Pivot, Western
http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp

for for irrigated acreage with corn and other crops in the region. The addition of soybean processing plants in western

Item	45	55	65	
Seed, 1,000/a*	135	150	150	$0.37/1,000

Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Sunflower

Sunflower

Load Defaults

General Input Costs

		Use optimal	
Nitrogen	0.05 lb/ac	☑	$ 0.44 /lb
Phosphorus	0.018 lb/ac	☑	$ 0.8 /lb
Seed	25500 seeds/ac	☑	$ 2.14 /1000 seeds

Herbicide $ 31.76 /acre

Insecticide $ 12.41 /acre

Subtotal $44.17/acre
*Not including nitrogen, phosphorus, seed

Operation Costs

Tillage $ 31.26 /acre

Planting $ 13.68 /acre

Fertilizer Appl $ 5.12 /acre

Insecticide Appl $ 5.24 /acre

Herbicide Appl $ 5.26 /acre

Harvesting Costs

◉ Itemized ○ Flat Rate

Base Charge $ 29.02 /acre

Extra charge for yields exceeding 1300 pounds $ 0 /lb.

Hauling $ 0 /lb.

Subtotal $60.56/acre
*Not including harvesting costs

Additional Returns and Costs

Misc Returns $ 0 /acre

Misc Costs $ 0 /acre

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SUNFLOWER Optimal Seeding Rate

Net Irrigation	Seeding Rate
18 in. and over	25,500 seeds / acre
15 - 17 in.	24,000 seeds / acre
12 - 14 in.	22,500 seeds / acre
9 - 11 in.	21,000 seeds / acre
6 - 8 in.	19,500 seeds / acre
0 - 5 in.	18,000 seeds / acre

Farm Management Guide MF-800

Center-Pivot-Irrigated Sunflowers Cost-Return Budget in Western Kansas

K·STATE Research and Extension

Department of Agricultural Economics — www.agmanager.info

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy J. Dumler, Agricultural Economist
Daniel M. O'Brien, Agricultural Economist

Sunflower is an economically viable crop alternative for growers in the High Plains region, including Kansas, Colorado, and Nebraska. The state of Kansas ranked third in the nation in oil-type sunflower acreage in 2002 with

Sunflower Prices
The sunflower prices used in these budgets do not include any premiums or discounts for oil content, foreign matter, or identification such as a mid-oleic or Nusun variety

MF-800 Sunflower, Center-Pivot, Western
http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp

Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Wheat

Wheat

General Input Costs

Use optimal

Nitrogen	1.75 lb/ac ☑	$ 0.44	/lb
Phosphorus	0.55 lb/ac ☑	$ 0.8	/lb
Seed	90 lb/ac ☑	$ 0.16	/lb
Herbicide	$ 2.75	/acre	
Insecticide	$ 11.8	/acre	

Subtotal $14.55/acre

*Not including nitrogen, phosphorus, seed

Operation Costs

Load Defaults

Tillage	$ 31.26	/acre
Planting	$ 12.48	/acre
Fertilizer Appl	$ 5.12	/acre
Insecticide Appl	$ 5.24	/acre
Herbicide Appl	$ 5.26	/acre

Harvesting Costs

◉ Itemized ○ Flat Rate

Base Charge	$ 24.12	/acre
Extra charge for yields exceeding 22 bushels	$ 0.24	/bu.
Hauling	$ 0.22	/bu.

Subtotal $59.36/acre

*Not including harvesting costs

Additional Returns and Costs

Misc Returns	$ 0	/acre
Misc Costs	$ 0	/acre

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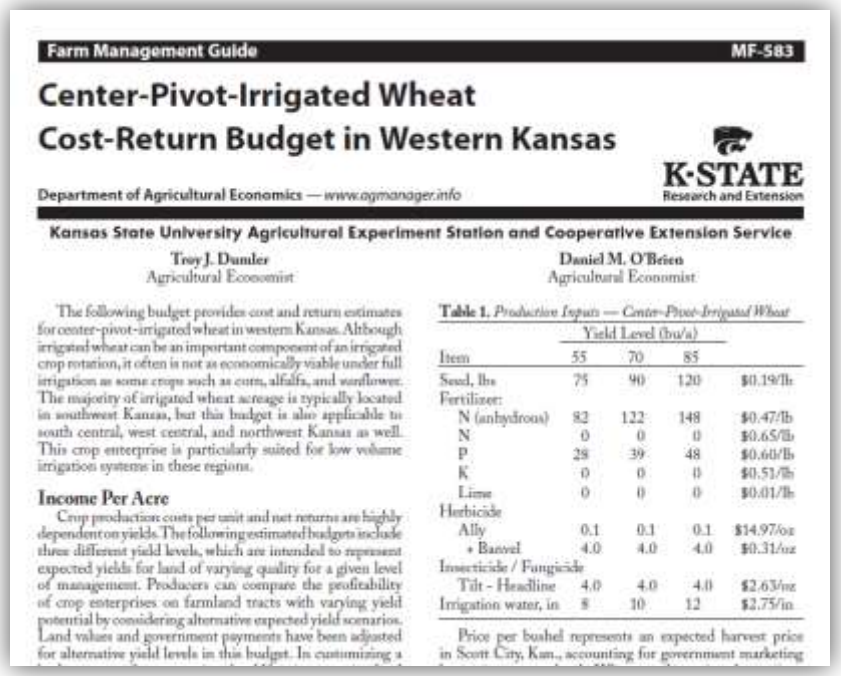
WHEAT Optimal Seeding Rate	
Net Irrigation	**Seeding Rate**
0 through 18 in.	90 lbs. / acre



Farm Management Guide MF-583

Center-Pivot-Irrigated Wheat Cost-Return Budget in Western Kansas

K·STATE Research and Extension

Department of Agricultural Economics — www.agmanager.info

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy J. Dumler, Agricultural Economist
Daniel M. O'Brien, Agricultural Economist

The following budget provides cost and return estimates for center-pivot-irrigated wheat in western Kansas. Although irrigated wheat can be an important component of an irrigated crop rotation, it often is not as economically viable under full irrigation as some crops such as corn, alfalfa, and sunflower. The majority of irrigated wheat acreage is typically located in southwest Kansas, but this budget is also applicable to south central, west central, and northwest Kansas as well. This crop enterprise is particularly suited for low volume irrigation systems in these regions.

Income Per Acre

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budgets include three different yield levels, which are intended to represent expected yields for land of varying quality for a given level of management. Producers can compare the profitability of crop enterprises on farmland tracts with varying yield potential by considering alternative expected yield scenarios. Land values and government payments have been adjusted for alternative yield levels in this budget. In customizing a

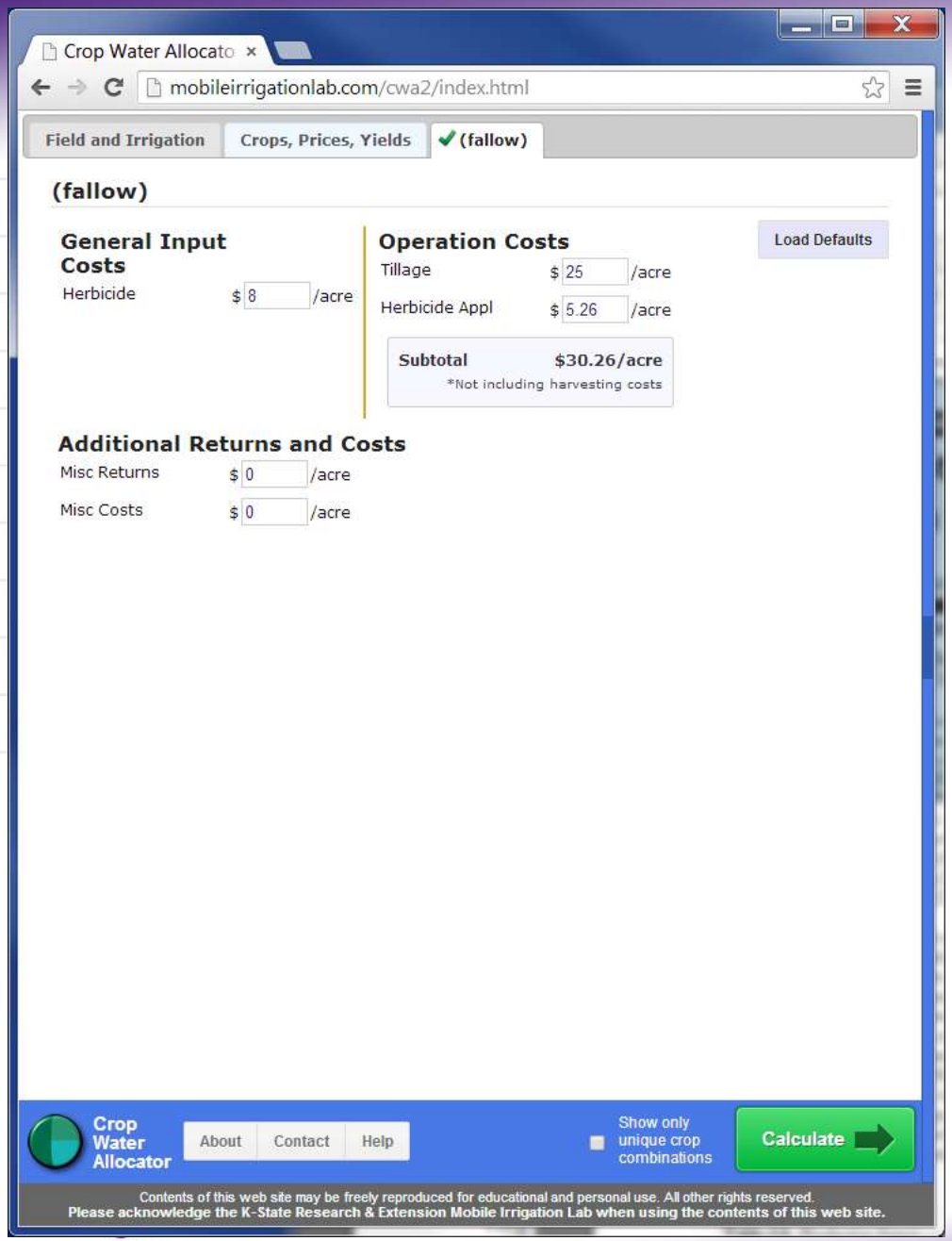
Table 1. *Production Inputs — Center-Pivot-Irrigated Wheat*

	Yield Level (bu/a)			
Item	55	70	85	
Seed, lbs	75	90	120	$0.19/lb
Fertilizer:				
N (anhydrous)	82	122	148	$0.47/lb
N	0	0	0	$0.65/lb
P	28	39	48	$0.60/lb
K	0	0	0	$0.51/lb
Lime	0	0	0	$0.01/lb
Herbicide				
Ally	0.1	0.1	0.1	$14.97/oz
+ Banvel	4.0	4.0	4.0	$0.31/oz
Insecticide / Fungicide				
Tilt - Headline	4.0	4.0	4.0	$2.63/oz
Irrigation water, in	8	10	12	$2.75/in

Price per bushel represents an expected harvest price in Scott City, Kan., accounting for government marketing

MF-583 Wheat, Center-Pivot, Western

http://www.agmanager.info/farmmgt/fmg/irrigated/default.asp



- If unsure, click "LOAD DEFAULTS"

NOTE

Unless specified, the succeeding examples use default values for Irrigation Information,

Crop Prices and Yields,

and Production Costs

Crop Water Allocato

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Load Defaults

	Price per unit:		Maximum Yield / Acre	
☑ Alfalfa	120	$/ton	9	tons
☑ Corn	6.52	$/bu.	220	bushels
☑ Sorghum	5.75	$/bu.	140	bushels
☑ Soybean	10.22	$/bu.	65	bushels
☑ Sunflower	0.2	$/lb.	3500	pounds
☑ Wheat	6.2	$/bu.	70	bushels
☑ (fallow)				

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☐ Show only unique crop combinations

Calculate

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Load Defaults

	Price per unit:		Maximum Yield / Acre	
Alfalfa	120	$/ton	9	tons
Corn	6.52	$/bu.	220	bushels
Sorghum	5.75	$/bu.	140	bushels
Soybean	10.22	$/bu.	65	bushels
Sunflower	0.2	$/lb.	3500	pounds
Wheat	6.2	$/bu.	70	bushels
(fallow)				

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Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn	198.5 bu	18.0	706	1294	588
2	130.0	Alfalfa	7.0 ton	18.0	597	841	243
3	130.0	Sorghum	125.8 bu	18.0	509	723	215
4	130.0	Sunflower	3231.4 lb	18.0	512	646	134
5	130.0	Soybean	54.3 bu	18.0	433	555	122
6	130.0	Wheat	68.5 bu	18.0	428	425	-3
7	130.0	(fallow)	0.0	18.0	245	0	-245

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Load Defaults

	Price per unit:		Maximum Yield / Acre	
☑ Alfalfa	120	$/ton	9	tons
☑ Corn	6.52	$/bu.	220	bushels
☑ Sorghum	5.75	$/bu.	140	bushels
☑ Soybean	10.22	$/bu.	65	bushels
☑ Sunflower	0.2	$/lb.	3500	pounds
☑ Wheat	6.2	$/bu.	70	bushels
☑ (fallow)				

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Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn	198.5 bu.	18.0	706	1294	588
2	130.0	Alfalfa	7.0 ton	18.0	597	841	243

100% Corn

Field Information & Totals

Acres: 130.0
Crop: Corn
Crop Price: $6.52 /bu.
Yield: 198.5 bu./acre
Applied Irrigation: 18.0 "
Effective Annual Rainfall: 14 "
Total Costs per Acre: $706
Total Returns per Acre: $1294
Net Return per Acre: $588

Irrigation Cost Information

Discharge Rate: 600 GPM
Pumping Water Lift: 200 feet
Well-head Pressure: 35 psi
Fuel Type: 1
Fuel Cost: 4.25
Labor Cost: $10 /hr
Maintenance & Repairs: $0.33 /acre-inch
Total Pumping Hours: 2500 hrs
Subtotal: $11.24 /ac

General Input Costs

Nitrogen Cost: $0.44/lb
Nitrogen Rate: 268.01 lb/ac
Phosphorus Cost: $0.8/lb
Phosphorus Rate: 85.37 lb/ac
Seed Cost: $2.89/ seed_units
Seed Rate: 32 seeds/ac
Herbicide Cost: $30 /ac
Insecticide: $36.48 /ac
Subtotal: $66.48 /ac

Operation Costs

Tillage Cost: $31.26 /ac
Planting Cost: $13.48 /ac
Fertilizer Application $5.12 /ac

Misc Costs and Returns

Misc Returns: $0.00 /ac
Misc Cost: $0.00 /ac

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres: 130

Soil type: Fine Sand

Annual Rainfall: 14 inches

Applied Irrigation: 18 inches

Land Split: 100

Irrigation Information

Load Defaults

Discharge Rate: 600 GPM

Season Pumping: 2500 hrs

Pumping Lift: 200 ft

Well-head Pressure: 35 psi

Efficiency: 90 %

Fuel Type: Diesel

Fuel: $ 4.25 /gal

Labor: $ 10 per hour

Repairs & Maint: 0.33 per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

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Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn	198.5 bu.	18.0	706	1294	588
2	130.0	Alfalfa	7.0 ton	18.0	597	841	243
3	130.0	Sorghum	125.8 bu.	18.0	509	723	215
4	130.0	Sunflower	3231.4 lb.	18.0	512	646	134
5	130.0	Soybean	54.3 bu.	18.0	433	555	122
6	130.0	Wheat	68.5 bu.	18.0	428	425	-3
7	130.0	(fallow)	0.0	18.0	245	0	-245

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres: 130

Soil type: Fine Sand

Annual Rainfall: 14 inches

Applied Irrigation: 0 inches

Land Split: 100

Dryland = "0" Irrigation

Irrigation Information

Discharge Rate: 600 GPM

Load Defaults

Season Pumping: 2500 hrs

Pumping Lift: 200 ft

Well-head Pressure: 35 psi

Efficiency: 90 %

Fuel Type: Diesel

Fuel: $ 4.25 /gal

Labor: $ 10 per hour

Repairs & Maint: 0.33 per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

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Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn	198.5 bu.	18.0	706	1294	588
2	130.0	Alfalfa	7.0 ton	18.0	597	841	243
3	130.0	Sorghum	125.8 bu.	18.0	509	723	215
4	130.0	Sunflower	3231.4 lb.	18.0	512	646	134
5	130.0	Soybean	54.3 bu.	18.0	433	555	122
6	130.0	Alfalfa	2.0 ton	0.0	156	239	83
7	130.0	(fallow)	0.0	0.0	38	0	-38
8	130.0	Sorghum	12.0 bu.	0.0	132	69	-63
9	130.0	Sunflower	470.4 lb.	0.0	189	94	-95
10	130.0	Wheat	2.1 bu.	0.0	115	13	-102
11	130.0	Soybean	0.0 bu.	0.0	149	0	-149
12	130.0	Corn	0.0 bu.	0.0	205	0	-205

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Field and Irrigation | Crops, Prices, Yields | ✓ Alfalfa | ✓ Corn | ✓ Sorghum | ✓ Soybean | ✓ Sunflower | ✓ Wheat | ✓ (fallow)

Field and Location Information

Acres	130	
Soil type	Fine Sand	
Annual Rainfall	24	inches
Applied Irrigation	0	inches
Land Split	100	

Larned area = ~ 24 " rainfall

Dryland = "0" Irrigation

Irrigation Inf

Discharge Rate	600	GPM
Season Pumping	2500	hrs
Pumping Lift	200	ft
Well-head Pressure	35	psi
Efficiency	90	%
Fuel Type	Diesel	
Fuel	$ 4.25	/gal
Labor	$ 10	per hour
Repairs & Maint	0.33	per ac-in

Load Defaults

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

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Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn	198.5 bu.	18.0	706	1294	588
2	130.0	Alfalfa	7.0 ton	18.0	597	841	243
3	130.0	Sorghum	125.8 bu.	18.0	509	723	215
4	130.0	Sunflower	3231.4 lb.	18.0	512	646	134
5	130.0	Soybean	54.3 bu.	18.0	433	555	122
6	130.0	Alfalfa	2.0 ton	0.0	156	239	83
7	130.0	(fallow)	0.0	0.0	38	0	-38
8	130.0	Sorghum	12.0 bu.	0.0	132	69	-63
9	130.0	Sunflower	470.4 lb.	0.0	189	94	-95
10	130.0	Wheat	2.1 bu.	0.0	115	13	-102
11	130.0	Alfalfa	4.9 ton	0.0	293	589	297
12	130.0	Sorghum	61.7 bu.	0.0	194	355	161
13	130.0	Wheat	52.4 bu.	0.0	195	325	130
14	130.0	Soybean	21.8 bu.	0.0	168	223	55
15	130.0	Sunflower	1378.3 lb.	0.0	222	276	53
16	130.0	Corn	45.2 bu.	0.0	256	295	39
17	130.0	(fallow)	0.0	0.0	38	0	-38

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres: 130

Soil type: Silt Loam

Annual Rainfall: 20 inches

Applied Irrigation: 11 inches

Land Split: 50-50

Irrigation Information

Discharge Rate: 600 GPM

Load Defaults

Season Pumping: 2500 hrs

Pumping Lift: 200 ft

Well-head Pressure: 35 psi

Efficiency: 90 %

Fuel Type: Diesel

Fuel: $ 4.25 /gal

Labor: $ 10 per hour

Repairs & Maint: 0.33 per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

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Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	65.0	Corn	193.1 bu.	11.0	577	1259	682
	65.0	Corn	193.1 bu.	11.0	577	1259	
2	65.0	Corn	165.5 bu.	8.8	559	1079	612
	65.0	Corn	207.3 bu.	13.2	647	1352	
3	65.0	Corn	143.8 bu.	6.6	505	938	574
	65.0	Corn	215.9 bu.	15.4	692	1408	
4	65.0	Sorghum	130.0 bu.	11.0	415	748	507
	65.0	Corn	193.1 bu.	11.0	577	1259	
5	65.0	Corn	193.1 bu.	11.0	577	1259	507
	65.0	Sorghum	130.0 bu.	11.0	415	748	
6	65.0	Corn	193.1 bu.	11.0	577	1259	503
	65.0	Alfalfa	7.0 ton	11.0	520	845	
7	65.0	Alfalfa	7.0 ton	11.0	520	845	503
	65.0	Corn	193.1 bu.	11.0	577	1259	
8	65.0	Sorghum	122.0 bu.	8.8	401	701	503
	65.0	Corn	207.3 bu.	13.2	647	1352	
9	65.0	Alfalfa	6.3 ton	8.8	463	760	501
	65.0	Corn	207.3 bu.	13.2	647	1352	
10	65.0	Corn	111.3 bu.	4.4	436	725	500
	65.0	Corn	219.8 bu.	17.6	722	1433	
11	65.0	Sorghum	110.0 bu.	6.6	360	632	494
	65.0	Corn	215.9 bu.	15.4	692	1408	
12	65.0	Alfalfa	5.6 ton	6.6	404	672	492
	65.0	Corn	215.9 bu.	15.4	692	1408	
13	65.0	Alfalfa	4.9 ton	4.4	347	589	477
	65.0	Corn	219.8 bu.	17.6	722	1433	
14	65.0	Sorghum	94.7 bu.	4.4	314	544	471
	65.0	Corn	219.8 bu.	17.6	722	1433	

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Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres	130	
Soil type	Silt Loam	
Annual Rainfall	20	inches
Applied Irrigation	11	inches
Land Split	50-50	

Irrigation Information

Discharge Rate	600	GPM
Season Pumping	2500	hrs
Pumping Lift	200	ft
Well-head Pressure	35	psi
Efficiency	90	%
Fuel Type	Diesel	
Fuel	$ 4.25	/gal
Labor	$ 10	per hour
Repairs & Maint	0.33	per ac-in

Load Defaults

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

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☑ Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	65.0	Corn	193.1 bu.	11.0	577	1259	682
	65.0	Corn	193.1 bu.	11.0	577	1259	
2	65.0	Sorghum	130.0 bu.	11.0	415	748	507
	65.0	Corn	193.1 bu.	11.0	577	1259	
3	65.0	Corn	193.1 bu.	11.0	577	1259	503
	65.0	Alfalfa	7.0 ton	11.0	520	845	
4	65.0	Soybean	57.4 bu.	11.0	335	587	467
	65.0	Corn	193.1 bu.	11.0	577	1259	
5	65.0	Sunflower	3141.6 lb.	11.0	415	628	448
	65.0	Corn	193.1 bu.	11.0	577	1259	
6	65.0	Wheat	60.4 bu.	6.6	287	374	402
	65.0	Corn	215.9 bu.	15.4	692	1408	
7	65.0	Sorghum	130.0 bu.	11.0	415	748	333
	65.0	Sorghum	130.0 bu.	11.0	415	748	
8	65.0	Alfalfa	7.0 ton	11.0	520	845	329
	65.0	Sorghum	130.0 bu.	11.0	415	748	

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Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres	130
Soil type	Silt Loam
Annual Rainfall	20 inches
Applied Irrigation	11 inches
Land Split	50-25-25

Irrigation Information

Load Defaults

Discharge Rate	600	GPM
Season Pumping	2500	hrs
Pumping Lift	200	ft
Well-head Pressure	35	psi
Efficiency	90	%
Fuel Type	Diesel	
Fuel	$ 4.25	/gal
Labor	$ 10	per hour
Repairs & Maint	0.33	per ac-in

Based on 600 gpm, 130 acres, and 2500 hours of pumping, you would

Crop Water Allocator | About | Contact | Help

Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	65.0	Corn	193.1 bu	11.0	577	1259	682
	65.0	Corn	193.1 bu	11.0	577	1259	
2	65.0	Sorghum	130.0 bu	11.0	415	748	507
	65.0	Corn	193.1 bu	11.0	577	1259	
3	65.0	Corn	193.1 bu	11.0	577	1259	503
	65.0	Alfalfa	7.0 ton	11.0	520	845	
4	65.0	Corn	193.1 bu	11.0	577	1259	647
	32.5	Corn	165.5 bu	8.8	559	1079	
	32.5	Corn	207.3 bu	13.2	647	1352	
5	65.0	Corn	193.1 bu	11.0	577	1259	592
	32.5	Sorghum	122.0 bu	8.8	401	701	
	32.5	Corn	207.3 bu	13.2	647	1352	
6	65.0	Corn	193.1 bu	11.0	577	1259	591
	32.5	Alfalfa	6.3 ton	8.8	463	760	
	32.5	Corn	207.3 bu	13.2	647	1352	
7	65.0	Corn	193.1 bu	11.0	577	1259	567
	32.5	Soybean	51.7 bu	8.8	327	528	
	32.5	Corn	207.3 bu	13.2	647	1352	
8	65.0	Corn	193.1 bu	11.0	577	1259	561
	32.5	Sunflower	2845.8 lb	8.8	395	569	
	32.5	Corn	207.3 bu	13.2	647	1352	
9	65.0	Corn	207.3 bu	13.2	647	1352	548
	32.5	Wheat	52.8 bu	4.4	249	327	
	32.5	Corn	207.3 bu	13.2	647	1352	
10	65.0	Corn	215.9 bu	15.4	692	1408	525
	32.5	(fallow)	0.0	0.0	38	0	
	32.5	Corn	207.3 bu	13.2	647	1352	

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mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sorghum | ✔ Soybean | ✔ Sunflower | ✔ Wheat | ✔ (fallow)

Field and Location Information

Acres	130
Soil type	Silt Loam
Annual Rainfall	20 inches
Applied Irrigation	11 inches
Land Split	25-25-25-25

Irrigation Information

Load Defaults

Discharge Rate	600	GPM
Season Pumping	2500	hrs
Pumping Lift	200	ft
Well-head Pressure	35	psi
Efficiency	90	%
Fuel Type	Diesel	
Fuel	$ 4.25	/gal
Labor	$ 10	per hour
Repairs & Maint	0.33	per ac-in

Based on 600 gpm, 130 acres, and 2000 hours of pumping, you would

Crop Water Allocator | About | Contact | Help

Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	65.0	Corn	193.1 bu.	11.0	577	1259	682
	65.0	Corn	193.1 bu.	11.0	577	1259	
2	65.0	Sorghum	130.0 bu.	11.0	415	748	507
	65.0	Corn	193.1 bu.	11.0	577	1259	
3	65.0	Corn	193.1 bu.	11.0	577	1259	503
	65.0	Alfalfa	7.0 ton	11.0	520	845	
4	65.0	Corn	193.1 bu.	11.0	577	1259	647
	32.5	Corn	165.5 bu.	8.8	559	1079	
	32.5	Corn	207.3 bu.	13.2	647	1352	
5	65.0	Corn	193.1 bu.	11.0	577	1259	592
	32.5	Sorghum	122.0 bu.	8.8	401	701	
	32.5	Corn	207.3 bu.	13.2	647	1352	
6	65.0	Corn	193.1 bu.	11.0	577	1259	591
	32.5	Alfalfa	6.3 ton	8.8	463	760	
	32.5	Corn	207.3 bu.	13.2	647	1352	
7	32.5	Corn	165.5 bu.	8.8	559	1079	612
	32.5	Corn	165.5 bu.	8.8	559	1079	
	32.5	Corn	207.3 bu.	13.2	647	1352	
	32.5	Corn	207.3 bu.	13.2	647	1352	
8	32.5	Alfalfa	4.9 ton	4.4	347	589	589
	32.5	Corn	207.3 bu.	13.2	647	1352	
	32.5	Corn	207.3 bu.	13.2	647	1352	
	32.5	Corn	207.3 bu.	13.2	647	1352	
9	32.5	Sorghum	94.7 bu.	4.4	314	544	586
	32.5	Corn	207.3 bu.	13.2	647	1352	
	32.5	Corn	207.3 bu.	13.2	647	1352	
	32.5	Corn	207.3 bu.	13.2	647	1352	
10	32.5	Sunflower	2234.0 lb.	4.4	324	447	559
	32.5	Corn	207.3 bu.	13.2	647	1352	

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Practice Scenarios

1. If Corn is $6.50 and available water for irrigation is 11 inches, at what price will Alfalfa and Sunflower break even with Corn?

   (Soil=silt loam, RF = 20in, Land split = 100%, default values for the rest)

Crop Water Allocato ×

mobileirrigationlab.com/cwa2/index.html

Field and Irrigation | Crops, Prices, Yields | ✔ Alfalfa | ✔ Corn | ✔ Sunflower

Load Defaults

	Price per unit:		Maximum Yield / Acre	
☑ Alfalfa	170	$/ton	9	tons
☑ Corn	6.50	$/bu.	220	bushels
☐ Sorghum	4.10	$/bu.	140	bushels
☐ Soybean	12.30	$/bu.	65	bushels
☑ Sunflower	0.35	$/lb.	3500	pounds
☐ Wheat	6.60	$/bu.	70	bushels
☐ (fallow)				

Crop Water Allocator | About | Contact | Help

☐ Show only unique crop combinations

Calculate

Rank	Acres	Crop	Yield /acre	Applied Irrigation inches	Operating Costs $/acre	Returns $/acre	Total Return net $/ac
1	130.0	Corn				1255	669
2	130.0	Alfalfa				845	324
3	130.0	Sunflower	3			597	182
4	130.0	Corn	193			55	669
5	130.0	Alfalfa	7			56	535
6	130.0	Sunflower	3141			42	528
7	130.0	Sunflower	3141.6 lb.				685
8	130.0	Alfalfa	7.0 ton				676
9	130.0	Corn	193.1 bu.				669

Alfalfa = $120/ton
Sunflower = $0.20/lb

Alfalfa = $150/ton
Sunflower = $0.30/lb

Alfalfa = $170/ton
Sunflower = $0.35/lb

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Practice Scenarios

1. If Corn is $6.50 and available water for irrigation is 11 inches, at what price will Alfalfa and Sunflower break even with Corn?

   (Soil=silt loam, RF = 20in, Land split = 100%, default values for the rest)

ANSWER:

Alfalfa = $ 170/ton and Sunflower $0.35/lb

Recent Prices

Fuel

- Diesel $3.41/gal
- Propane $1.98/gal
- Natural Gas $4.50/mcf
- Electricity $0.10/kWh

Crop Prices

- Alfalfa $227.50
- Corn $4.38
- Sorghum $4.10
- Soybean $12.36
- Sunflower $0.19
- Wheat $6.60

For simplicity, please leave the rest of the parameters on default values

Sample Scenarios

1. If Corn is $4.38 and available water for irrigation is 11 inches, at what price will Alfalfa and Soybean break even with Corn?

   (Soil=silt loam, RF = 20in, Land split = 100%, Fuel = Electricity)

ANSWER:

Alfalfa = $ 111/ton and Soybean = $10.35/lb

Sample Scenarios

2. At the current price of crops, what should be the yield of corn to be more profitable than Soybean assuming the available irrigation is 20 inches?

   (Soil=silt loam, Land split = 100%, RF=20in, Fuel = Electricity)

ANSWER:

Corn = > 265 bushels (net = >$479)

Sample Scenarios

3. At the current price of crops, what is the best crop combination for a 50-50 land split, Corn-Sunflower, Corn-Sorghum or Corn-Soybean?

   (Soil=silt loam, Land split = 50-50%, RF=18in, Irrigation = 16in, Fuel = Electricity)

ANSWER:

Corn-Soybean = $405 (vs. C-Sun $321 and C-Sorghum $262)

Sample Scenarios

4. If the producer is from Meade (RF=21in), at what depth of irrigation should I consider Sorghum over Corn?

   (Soil=silt loam, Land split = 100%,

   Fuel = Electricity)

ANSWER:

Irrigation depth = 4in (Sorghum = $115 vs Corn= $93)

Sample Scenarios

5. If the producer is from Scott City (RF=19in), at what depth of irrigation should I consider Sorghum over Corn?

   (Soil=silt loam, Land split = 100%,

   Fuel = Electricity)

ANSWER:

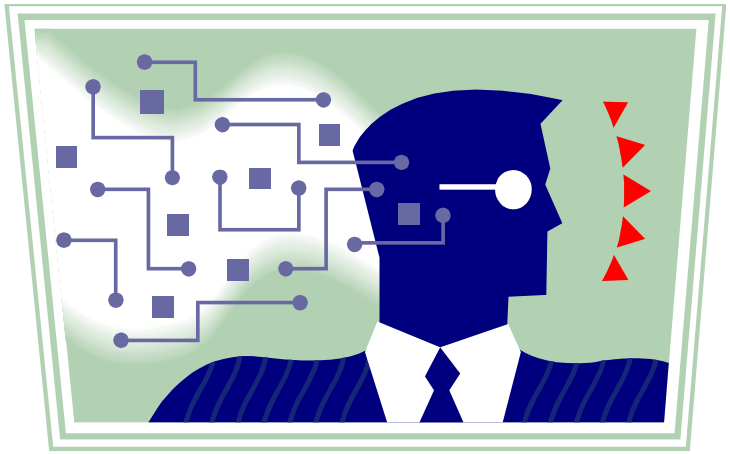
Irrigation depth = 6in (Sorghum = $115 vs Corn= $106)

Tips

- CWA knows what you did last summer!
- To completely remove the previous calculations, remove the cookies linked to mobileirrigationlab.com
- If you have updated and reliable values or prices, use them instead of the default values
- If you encounter problems with the online version, try another browser or use the downloadable version

Tips

- As with other models, do not rely solely on the absolute values the CWA computes, but rather give more importance on the relative differences of each options



QUESTIONS?

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