

Long Range Financial Impact Of Changing Cotton Rotation Under Declining Irrigation Capacity



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Texas Southern High Plains Irrigation Situation

- Declining capacity
- Increased efficiency
- Increasing energy costs
- Varieties with higher potential yields



Model Farm to Evaluate Alternative Cropping Strategies

- 2100 acres
- Continuous cotton
- Contingent crop of grain sorghum
- 640 acres owned
- 1460 share leased (75/25)
- 860 acres center pivot irrigated



Baseline Financial Assumptions

- Total assets - \$611,500
- Total debt - \$224,953
- Debt-to-asset ratio – 37%
- Family living - \$40,000
- Off-farm salary - \$15,000
- Employee salaries - \$64,000 (2 FT + PT)



Income & Expense Assumptions

- Cotton price - \$0.65/lb.
- Wheat price - \$8.00/bu.
- Irrigation energy cost - \$12/ac in
- Nitrogen - \$0.60/unit
- Phosphate - \$0.60/unit



Baseline Production Assumptions

- Irrigate to 50% ET replacement on all of each pivot
- Cotton Yield
 - Irrigated 750 lbs/ac
 - Dryland 250 lbs/ac
- Irrigation capacity – 2.5 gpm/ac
- Water applied – 10 ac in
- Nitrogen applied – 90 units
- Phosphate applied – 25 units

First Alternative Analyzed

- Fully irrigate (100% ET replacement) 1/2 of each pivot, remainder is treated as dryland.
- Cotton Yield
 - Irrigated 1250 lbs/ac
 - Dryland 250 lbs/ac
- 20 ac in of water applied
- 180 units of nitrogen
- 50 units of phosphate

Second Alternative Analyzed

- Irrigate to 75% ET replacement on 2/3 of each pivot, remainder is treated as dryland.
- Cotton Yield
 - Irrigated 1000 lbs/ac
 - Dryland 250 lbs/ac
- 15 ac in of water applied
- 135 units of nitrogen
- 38 units of phosphate



Third Alternative Analyzed

- Fully irrigate (100% ET replacement) 1/2 of each pivot, remainder is irrigated wheat for grain.
- Yield
 - Irrigated cotton 1250 lbs/ac
 - Irrigated wheat 42 bus/ac
- 20 ac in of water applied to cotton
- 7 ac in of water applied to wheat
- 180 units of nitrogen (cotton)
- 50 units of phosphate (cotton)

Fourth Alternative Analyzed

- Irrigate to 75% ET replacement on 2/3 of each pivot, remainder is irrigated wheat for grain.
- Yield
 - Irrigated cotton 1000 lbs/ac
 - Irrigated wheat 42 bus/ac
- 15 ac in of water applied
- 7 ac in of water applied to wheat
- 135 units of nitrogen
- 38 units of phosphate



Fifth Alternative Analyzed

- Fully irrigate (100% ET replacement) 1/2 of each pivot, remainder is irrigated wheat for grazing stocker cattle on gain.
- Yield
 - Irrigated cotton 1250 lbs/ac
 - Irrigated wheat - 2 head per acre at 2 lbs gain/day
- 20 ac in of water applied
- 7 ac in of water applied to wheat
- 180 units of nitrogen (cotton)
- 50 units of phosphate (cotton)
- Stocker cattle lease rate \$0.35/lb



Sixth Alternative Analyzed

- Irrigate to 75% ET replacement on 2/3 of each pivot, remainder is irrigated wheat for grazing stocker cattle on gain.
- Yield
 - Irrigated cotton 1250 lbs/ac
 - Irrigated wheat - 2 head per acre at 2 lbs gain/day
- 15 ac in of water applied
- 7 ac in of water applied to wheat
- 135 units of nitrogen (cotton)
- 38 units of phosphate (cotton)
- Stocker cattle lease rate \$0.35/lb

Analysis Method

- The FARM Assistance model was used to evaluate the 10 year outcome and risk level of the baseline and each of the 6 alternatives.
- A comparison of key financial ratios was prepared.



Results

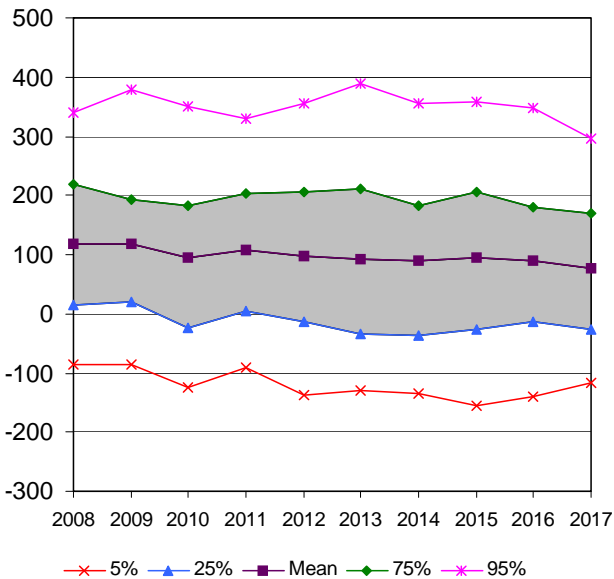
	Base	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
% Change RNW	84	137	114	195	153	-148	-175
Ending Real Net Worth (\$1000)	650	838	754	1041	894	-169	-263
Ending Debt to Asset Ratio (%)	34	25	29	17	21	124	137
Net Cash Farm Income (\$1000)	98	131	116	169	141	-32	-44

Results

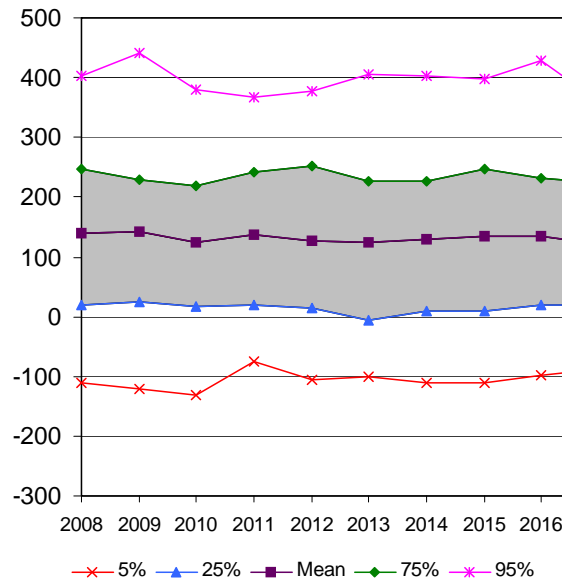
	Base	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
Operating Exp to Rcpt Ratio	.85	.81	.83	.77	.80	.97	.98
Ending Cash Reserves (\$1000)	141	374	270	625	444	-877	-994
Prob. Of Ending Cash < Zero (%)	34	22	27	11	17	93	94

Projected Variability in Net Cash Farm Income – All Cotton

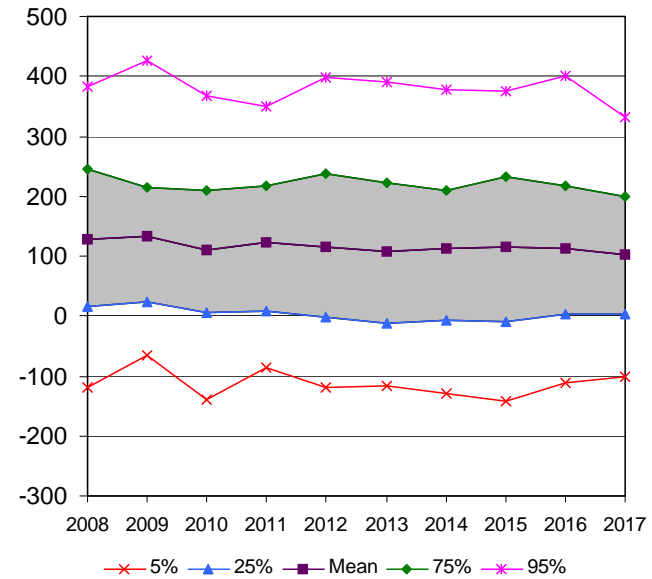
All Cotton 50% ET



All Cotton 100% ET

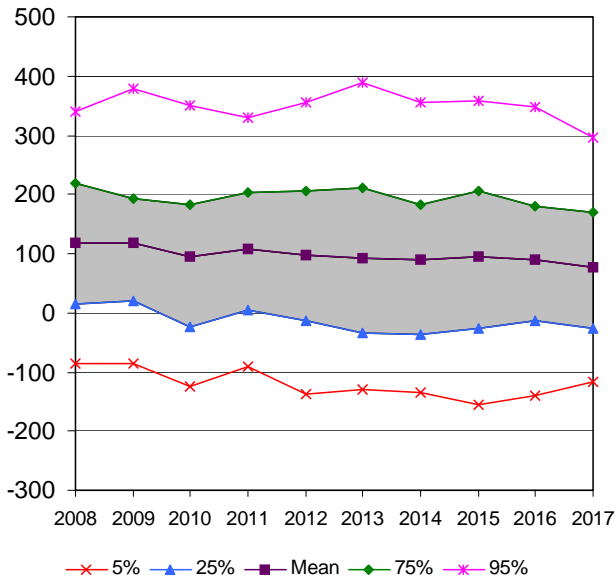


All Cotton 75% ET

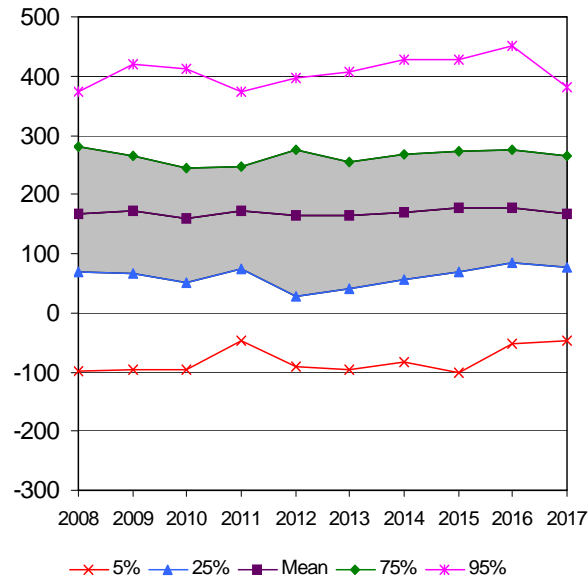


Projected Variability in Net Cash Farm Income – Cotton/Wheat Grain

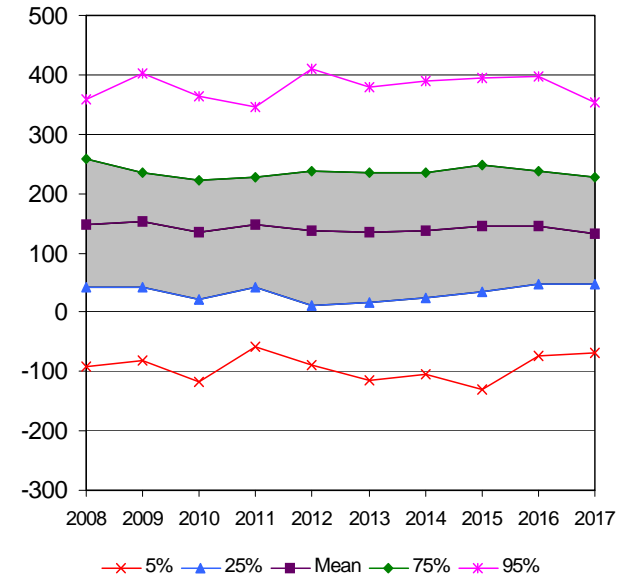
All Cotton 50% ET



Cotton/Wheat 100% ET

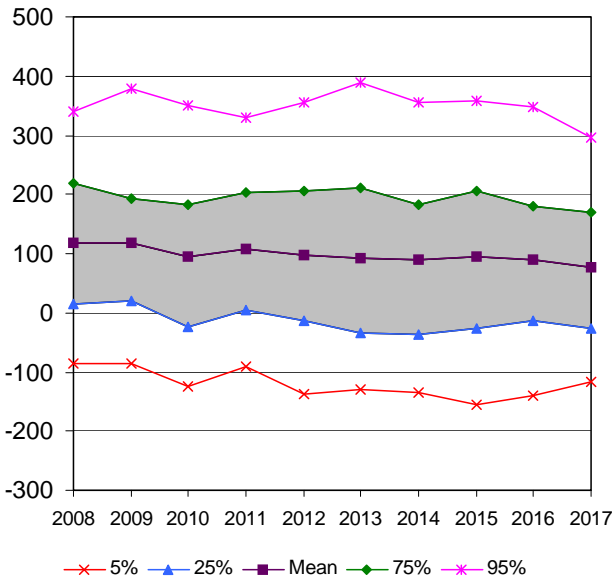


Cotton/Wheat 75% ET

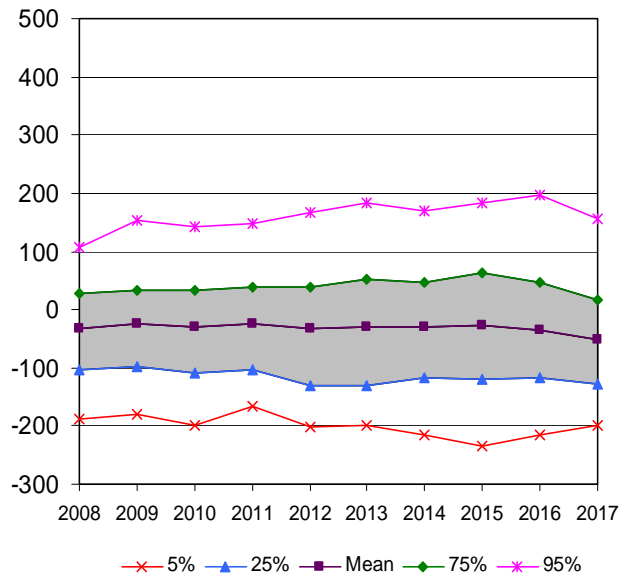


Projected Variability in Net Cash Farm Income – Cotton/Wheat Graze

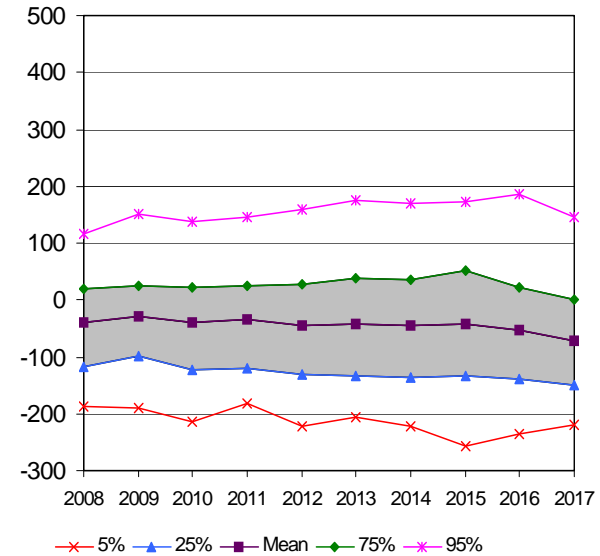
All Coton 50% ET



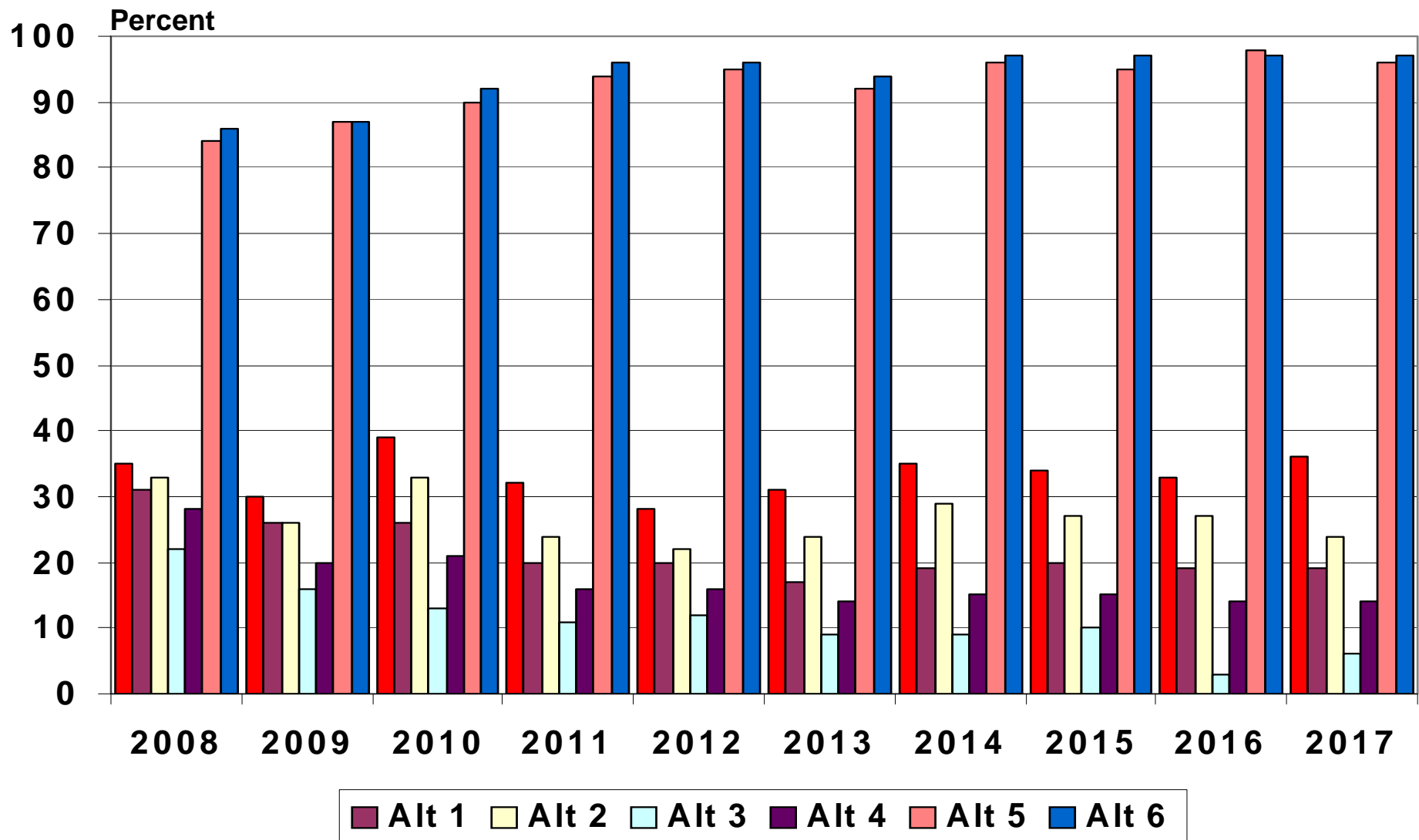
Cotton/Wheat/Stocker 100% ET



Cotton/Wheat/Stocker 75% ET



Probability of Having to Refinance Operating Note



Conclusions

- Least favorable – Anything to do with stocker cattle
- Most favorable - Irrigate to 100% ET replacement on 1/2 of each pivot, remainder planted to irrigated wheat.
- Next best - Irrigate to 75% ET replacement on 2/3 of each pivot, remainder planted to irrigated wheat.

Texas AgriLife Extension Service Risk Management Resources

- Websites
 - <http://agecoext.tamu.edu/>
 - <http://farmassistance.tamu.edu/>
 - <http://mastermarketer.tamu.edu/>
- District Risk Management Specialist
 - Jay Yates – Lubbock
 - 806-746-6101
 - jayates@ag.tamu.edu

