

Ag Risk-5

*tools for managing risk and
evaluating risk management strategies*



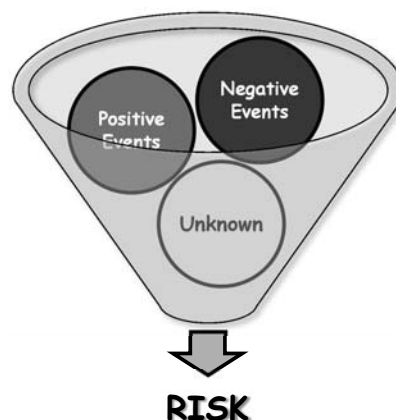
John P. Hewlett
University of Wyoming

Jay Parsons
Colorado State University

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What is RISK?

- **Certainty**- lack of doubt
- **Uncertainty**- doubt about future events
- **RISK**- potential variation in the outcome of future events



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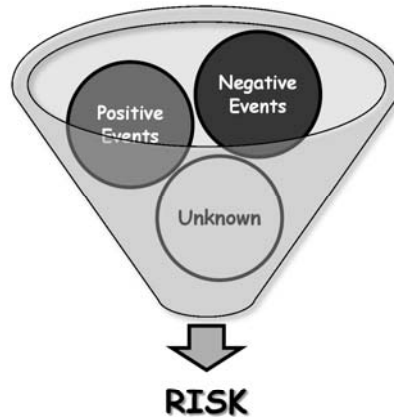
What is RISK?

- **Cost of Loss**

- *Income*
- *Resources*
- *Productive capacity, etc.*

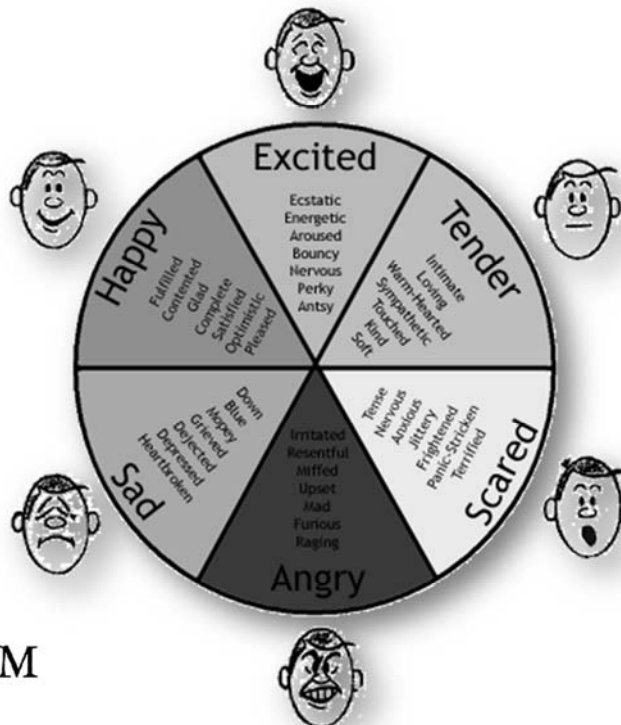
- **Cost of Uncertainty**

- *Worry, doubt, fear, misallocation of resources, etc.*
- *With potential for gain or loss comes moral or ethical implications*



The Human Dimension of Risk Management

EMOTION

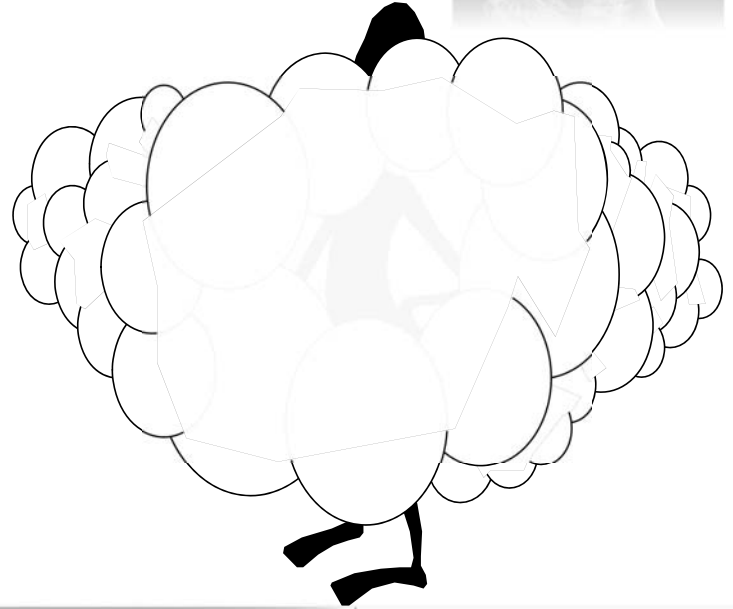


- Introduction
- Strategic
- Tactical
- Operational
- Ag Risks
- Do It Yourself
- Risk Navigator SRM

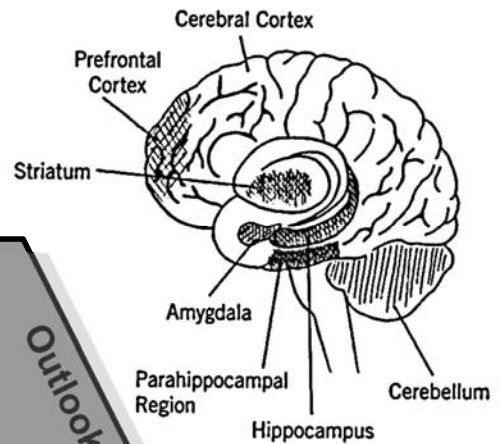
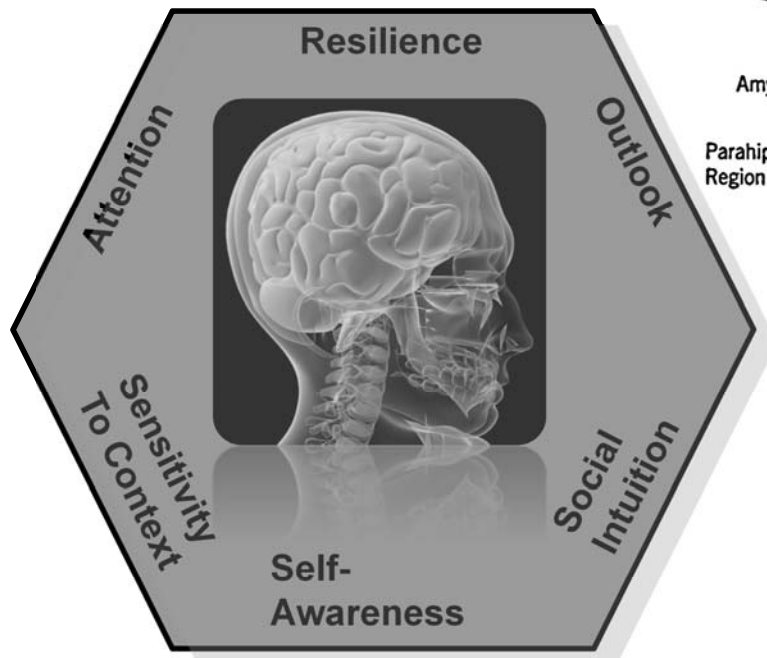
The HUMAN Dimension of Risk



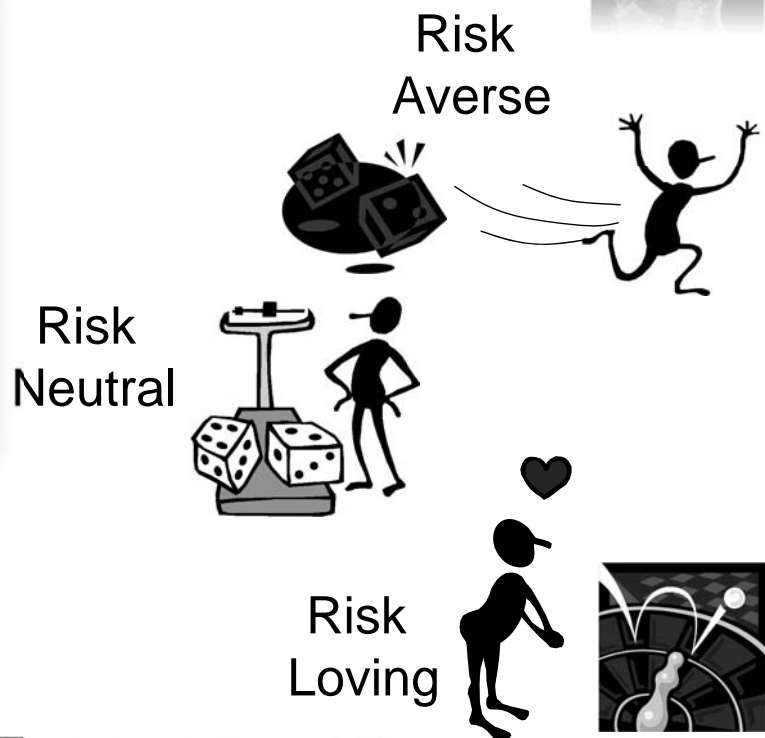
- Emotionally we avoid risk (uncertainty) to avoid the shame of:
 - Failure,
 - Being wrong,
 - Being laughed at
 - Being made fun of,
 - Loosing the farm, etc.



Risk Tolerance: Emotional Style*



Types of Risk Preference



Personal Perspectives on Risk

- Generational differences
- Gender differences
- Life stage/family differences
- Life experiences

dynamic and changing over time.



Profits are returns for taking risks



- **Upside:** Greater risk taking usually leads to greater wealth over time
- **Downside:** Losses from risk taking can potentially be devastating
- Managing risks are a matter of **evaluating tradeoffs**
- How much **risk** (uncertainty) are you willing to accept for **possible higher returns?**

Sources of Risk in Agriculture - *Ag Risk 5*

1. Marketing/Price Risk
2. Production Risk
3. Institutional/Legal Risk
4. Human Risk
5. Financial Risk



Marketing and Price Risk

Prices of inputs or outputs that change after you commit to a plan of action.

What are Your Sources?

- Total national production
- Government programs
- Demand (including quality issues)
- Seasonal effects



Marketing and Price Risk

What are Your Management Controls?

- Forward pricing or contracting
- Diversified market timing
- Diversified production
- Selecting low price risk enterprises
- Obtaining market outlook reports (information)
- Negotiated lease agreements
- Crop Insurance



Production Risk

Uncontrollable events such as weather, pests or disease make yields, quality, or outputs unpredictable.

What are Your Sources?

- Weather
- Pests
- Disease
- Genetic variations
- Timing of operations



U.S. Drought Monitor



Production Risk

What are Your Management Controls?

- Selecting low production risk enterprises
- Using low-risk production practices
- Diversification
- Maintaining flexibility and extra capacity
- Utilizing land over a wide spread area
- Crop insurance



Institutional Risk

Government or other institutional rules, regulations and policies effect profitability through costs or returns.

What are Your Sources?

- Changes in social attitudes
- Changing regulations about land use and environmental quality
- The possibility of lawsuits for accidents or misuse of chemicals



Institutional Risk

What are Your Management Controls?

- Maintaining a liability insurance program
- Keeping informed of new regulations and interpretations of the law



Human Risk

The character, health or behavior of the people involved in your operation introduces risk.

What are Your Sources?

- Health issues
- Divorce
- The possibility of losing a key employee
- Moral or the mental state of the work force



Human Risk

What are Your Management Controls?

- A backup management plan
- A plan to deal with the possible loss of a key employee
- Maintaining a health and life insurance program
- Establishing and maintaining an estate plan
- A good employee benefit package



Financial Risk

Financial risk is the extra risk that is attached to being leveraged. Added variability resulting from debt financing.

What are Your Sources?

- Possibility of losing a lease
- Production, prices, or casualty losses
- Unstable financial partners
- Anything that would negatively affect cash flow and the ability to meet debt obligations



Financial Risk

What are Your Management Controls?

- Maintaining a financial cushion
- Practicing solid land leasing strategies
- Incorporating all or part of your operation
- Maintaining up-to-date financial information



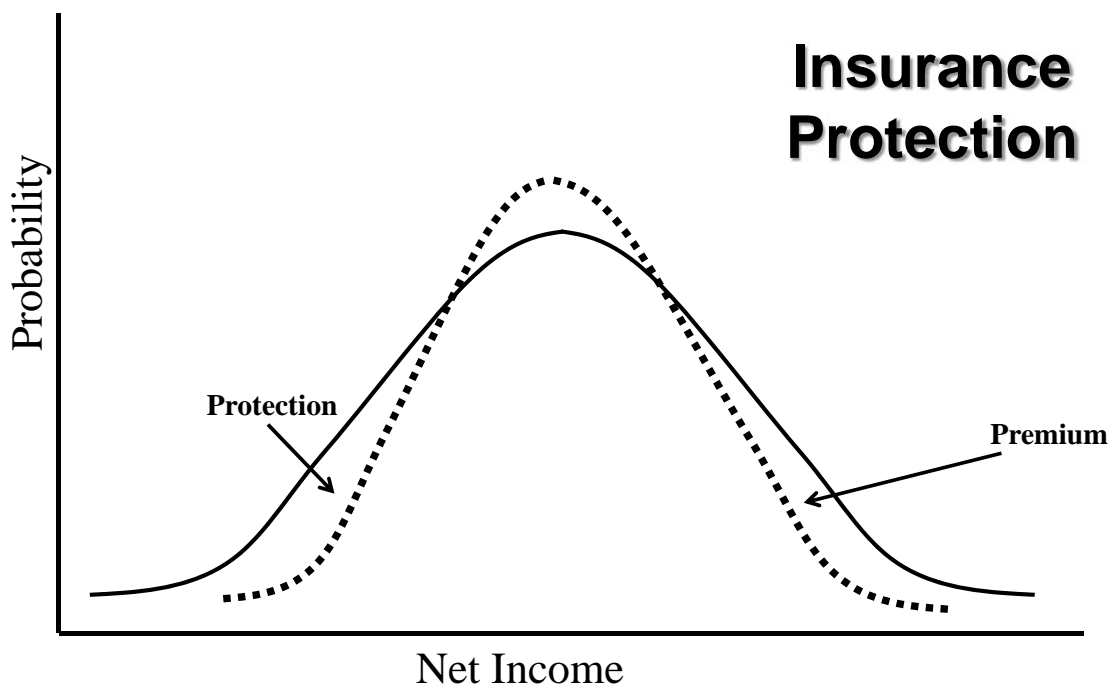
Strategies for Managing Risk

1. Avoid it
2. Reduce it
 - a) Reduce the probability it will happen
 - b) Reduce the impact if it does happen
3. Transfer it outside the business
 - a) Insurance
 - b) Contracting
4. Increase capacity to bare
 - a) Increase reserves
 - b) Maintain flexibility
5. Accept it



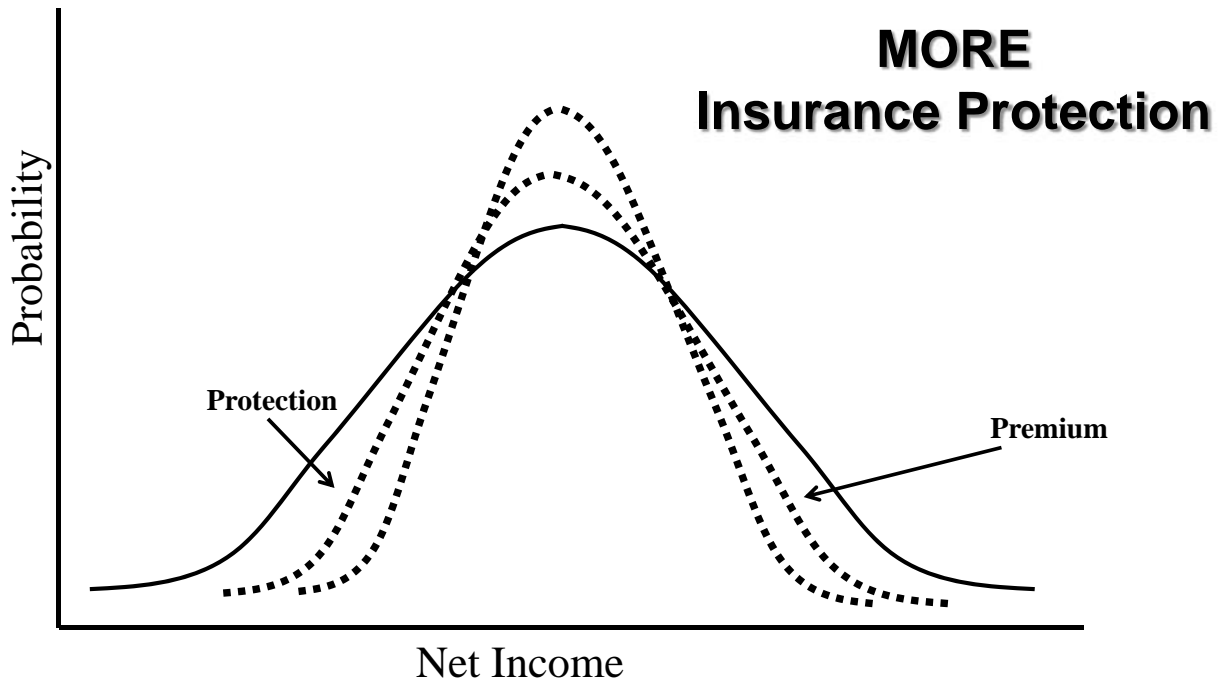
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How much risk is right for you?



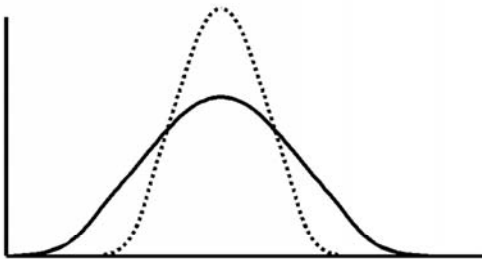
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How much risk is right for you?

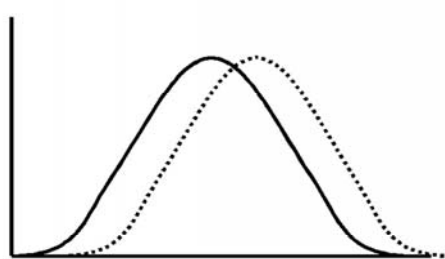


Strategy Impacts

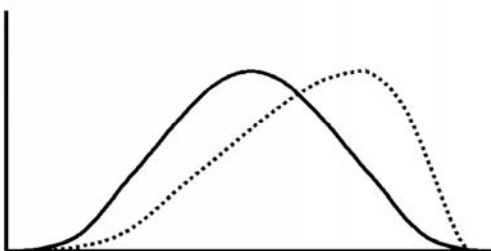
Panel 1: Same Mean, Less Dispersion



Panel 2: Same Dispersion, Higher Mean



Panel 3: Skewing the distribution



Panel 4: Truncating the Distribution



Current Federal Insurance Options

Insurance Plans Available in CALIFORNIA			
Insurable Crops	Insured Acres	Total Acres	Percent Insured
Alfalfa Seed	15,416	29,023	53%
Almonds	692,001	876,105	79%
Apples	5,694	13,026	32%
Avocados	36,147	53,656	67%
Barley	48,002	100,000	48%
Strawberries	2,216	3,000	74%
Cherries	28,852	39,173	74%
Citrus - 8 types of fruit	227,953	257,382	89%
Corn	232,551	450,000	52%
Cotton & ELS Cotton	263,497	280,000	94%
Beans (Dry)	17,911	49,000	37%
Eggs	4,216	8,041	52%
Forage Production	135,188	921,910	15%
Grapes (Table)	84,951	92,197	92%
Grapes (Wine)	484,439	587,800	83%
Grain Sorghum	853	6,249	14%
Mint	1,849	3,200	58%
Oats	3,200	6,829	47%
Olive	25,131	44,000	57%
Onions	4,239	56,145	8%
Pears	8,899	14,000	63%
Pecans	300	3,800	8%
Pistachios	87,887	178,000	49%
Pistachios (Rainfall Index)	18,404	33,000	56%
Prunes	48,882	61,988	79%
Rice	463,402	553,110	84%
Rice (Cultivated Wild)	13,329	16,000	83%
Safflower	44,868	87,000	51%
Stonefruit (Includes Plums)	56,543	126,698	45%
Strawberries	136	38,000	0%
Sugar Beets	3,894	24,000	16%
Tomatoes (Fresh)	13,139	30,000	44%
Tomatoes (Processing)	262,874	266,000	99%
Walnuts	140,393	289,809	48%
Wheat	344,519	558,150	62%
Dollar Liability Program			
Adjusted Gross Revenue			\$59,927,037
Acquidure (Rainfall Index)			\$12,382,423
Forage Seeding			\$68,047,453
Livestock Gross Margin (LGM) Dairy			\$1,071,653
Livestock Risk Protection (LRP) Lamb			\$192,542,014
Nursery			\$12,088,133
Pasture, Rangeland, Forage (Rainfall Index)			\$24,108,811
Crop Pilot Programs			
Program	County Availability		
Adjusted Gross Revenue	Fresno, Kern, Riverside, San Diego, San Joaquin, San Luis Obispo, Tulare and Ventura Counties		
Acquidure (Rainfall Index)	All Counties		
Avocados	Orange, Riverside, San Diego, San Luis Obispo, Santa Barbara and Ventura Counties		
Cherries	Butte, Contra Costa, Fresno, Kern, Kings, Madera, Merced, Placer, Sacramento, San Benito, Santa Clara, San Joaquin, Stanislaus, Sutter, Tulare and Yuba Counties		
Citrus (Dollar Payers)	Fresno, Kern, Madera and Tulare Counties		
Forage (Alfalfa Seed)	Kings and Fresno Counties		
Olive	Butte, Colusa, Fresno, Glenn, Tehama, Kern, Madera, San Joaquin, Shasta, Stanislaus, Sutter, Tulare and Yolo Counties		
Strawberries	Fresno, Merced, Monterey, Santa Barbara, Santa Cruz and Ventura Counties		
PRF (Rainfall Index)	All Counties		
Pistachios	Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Kings, Madera, Merced, Riverside, San Benito, San Bernardino, San Joaquin, San Luis Obispo, Santa Barbara, Stanislaus, Sutter, Tehama, Tulare, Yolo and Yuba Counties		

2013 California Crop Insurance Profile

Davis Regional Office
 Contact: Jeff Yasui, Director
 Address: 430 O Street
 #4168
 Davis, CA 95618
 Phone: (530) 792-5870
 Fax: (530) 792-5993
 E-Mail: jeff.yasui@rma.usda.gov

Western Regional Compliance Office
 Contact: Susan Choy, Director
 Address: 430 O Street
 #4167
 Davis, CA 95618
 Phone: (530) 792-5850
 Fax: (530) 792-5965
 E-Mail: susan.choy@rma.usda.gov

Data as of January 2014

<http://www.rma.usda.gov/pubs/2014/stateprofiles/california13.pdf>

California Fifteen Year Crop Insurance History

Year	Policies Earning Premium	Net Acres Insured	Liability	Gross Premium	Losses	Loss Ratio
1999	28,590	4,023,277	2,494,656,258	130,826,215	133,134,448	1.02
2000	29,191	4,276,811	2,796,253,781	143,343,081	92,359,660	0.64
2001	27,958	4,010,128	2,690,254,801	142,519,840	117,359,756	0.82
2002	27,200	3,920,007	2,633,618,262	146,355,279	79,669,848	0.54
2003	26,471	3,950,439	2,951,841,797	150,191,677	79,366,135	0.53
2004	25,629	3,908,123	3,153,568,412	157,913,894	83,152,323	0.53
2005	24,859	3,818,813	3,317,832,821	168,995,411	92,497,107	0.55
2006	24,490	3,732,668	3,658,867,941	166,617,268	88,506,353	0.47
2007	24,207	3,780,829	3,708,288,115	187,455,253	154,139,100	0.82
2008	24,074	3,810,375	3,911,646,512	197,920,945	89,455,031	0.45
2009	24,723	3,932,306	4,648,316,411	243,273,227	177,694,925	0.73
2010	24,649	3,752,230	4,493,432,544	219,282,609	111,142,020	0.51
2011	24,726	4,062,207	4,792,588,260	248,895,972	110,209,054	0.44
2012	25,462	4,600,044	5,394,444,735	260,903,031	112,207,209	0.43
2013*	25,470	5,233,794	6,097,497,679	268,604,558	82,422,389	0.29

* 2013 numbers are incomplete

Current Federal Insurance Options - Crops

Federal Crop Insurance Corporation Crop Year Statistics for 2013 As of: 5/19/2014 Nationwide Summary - By State/Crop													
Crop	Ins Plan	Pol Sold	Pol Earn Prem	Pol Indem	Units Earn Prem	Units Indem	Net Acres	Liabilities	Total Premium	Subsidy	Cost Share	State Prem Sbdy Dscnt	Indemnity Loss Ratio
CALIFORNIA													
ADJUSTED GROSS REVENUE	AGR	58	47	0	47	0	0	34,840,057	1,416,522	761,304	0	0	0.00
ALFALFA SEED	APH	52	1	3,854	84	1	10,581	14,105,093	573,098	339,328	0	0	3,856.01
ALMONDS	APH	3,894	3744	177	5,901	196	695,616	1,517,069,955	55,343,395	36,083,880	0	0	4,292,712.08
APICULTURE	RAINF	190	189	186	736	687	0	10,414,535	2,969,479	1,563,974	0	0	5,545,093.187
APPLES	APH	123	110	27	230	35	5,658	21,910,284	3,215,918	2,052,786	0	0	1,151,774.36
AVOCADOS	APH	1,081	1037	78	1,138	78	35,805	72,259,384	8,665,290	7,415,855	0	0	732,933.08
BARLEY	RP	77	18	14	41	21	8,504	1,662,243	436,823	252,605	0	0	677,428.155
	RHPPE	6	2	1	3	2	514	38,544	17,908	12,722	0	0	7,063.40
	YP	567	86	38	134	61	38,756	4,936,645	1,098,082	741,056	0	0	2,227,841.203
BARLEY Total		650	106	53	178	84	47,774	6,637,432	1,552,813	1,006,383	0	0	2,912,362.188
Federal Crop Insurance Corporation Crop Year Statistics for 2013 As of: 5/19/2014 Nationwide Summary - By State/Crop													
Crop	Ins Plan	Pol Sold	Pol Earn Prem	Pol Indem	Units Earn Prem	Units Indem	Net Acres	Liabilities	Total Premium	Subsidy	Cost Share	State Prem Sbdy Dscnt	Indemnity Loss Ratio
CALIFORNIA													
PLUMS	APH	354	311	44	797	82	14,151	26,493,269	3,059,102	2,068,851	0	0	0.757,691.25
POTATOES	APH	104	56	4	182	13	18,926	36,912,644	2,387,820	1,640,507	0	0	0.981,960.41
PROCESSING APRICOTS	APH	49	41	3	64	5	2,907	3,599,285	527,951	308,356	0	0	0.183,485.35
PROCESSING CLING PEACHES	APH	358	345	30	960	47	16,134	42,845,401	1,764,388	1,049,095	0	0	0.410,949.23
PROCESSING FREESTONE	APH	78	63	1	98	2	2,860	5,987,822	216,357	129,674	0	0	0.95,319.44
PRUNES	APH	641	615	340	862	446	48,496	55,203,797	10,870,139	6,570,306	0	0	12,657,198.116
Pistachios	APH	437	396	98	516	117	87,919	200,652,566	7,476,615	5,817,145	0	0	0.4,580,889.61
RAISINS	DOL	1,646	1373	14	2,396	15	0	249,926,786	13,725,643	8,512,133	0	0	0.123,043.01
RICE	RP	79	24	1	53	1	6,675	5,147,936	214,573	131,364	0	0	0.3,234.02
	RHPPE	116	104	2	278	3	44,806	43,681,679	1,534,102	1,106,258	0	0	0.83,970.05
	YP	1,612	1262	71	2,304	106	411,577	248,300,787	6,693,088	4,314,052	0	0	0.3,236,674.48
RICE Total		1,807	1,390	74	2,635	110	463,058	297,130,402	8,441,763	5,551,674	0	0	0.3,323,878.39
SAFFLOWER	APH	511	68	5	101	5	34,588	5,321,832	719,597	679,231	0	0	0.65,582.09
SUGAR BEETS	APH	7	6	0	7	0	3,694	2,722,653	37,314	35,724	0	0	0.0.00
SWEET ORANGES	APH	75	65	3	67	3	436	842,230	65,669	38,120	0	0	0.10,517.16
Strawberries	ARH	7	2	0	3	0	136	2,519,606	74,728	47,872	0	0	0.0.00
TABLE GRAPES	APH	431	356	35	1,153	52	84,874	251,103,013	9,670,149	7,885,504	0	0	0.2,068,816.21
TOMATOES	APH	1,019	525	87	2,537	144	253,174	450,704,562	7,952,985	4,686,427	0	0	0.7,759,496.98
VALENCIA ORANGES	APH	978	930	68	1,225	75	31,259	48,405,038	4,412,327	2,822,814	0	0	0.1,850,801.42
WALNUTS	APH	1,323	1263	63	1,709	75	140,004	257,626,508	7,722,341	5,807,744	0	0	0.1,104,107.14
WHEAT	RP	299	121	62	334	139	91,056	24,089,621	5,777,140	3,751,401	0	0	0.7,380,630.128
	RHPPE	50	23	7	56	15	10,246	4,095,888	616,408	428,834	0	0	0.308,820.50
	YP	1,655	689	51	1,118	85	243,446	52,558,873	5,470,135	4,922,381	0	0	0.1,741,652.32
WHEAT Total		2,004	833	120	1,508	239	344,748	80,744,382	11,863,683	9,102,616	0	0	0.9,431,102.79
CALIFORNIA Total		33,325	25,408	2,678	48,175	4,290	5,240,534	6,139,821,032	288,737,222	192,491,937	0	0	0.124,979,245.43
Grand Total		33,325	25,408	2,678	48,175	4,290	5,240,534	6,139,821,032	288,737,222	192,491,937	0	0	0.124,979,245.43

Current Federal Insurance Options - *Livestock*

Federal Crop Insurance Corporation
Reinsurance Year Statistics for 2013
As of: 5/21/2014
Nationwide Summary - By State/Commodity

Commodity	Ins Plan	Pol Sold	Pol Earn Prem	Pol Indem	Units Earn Prem	Units Indem	Number of Head *	Liabilities	Total Premium	Subsidy	Indemnity	Loss Ratio
CALIFORNIA												
DAIRY CATTLE	LGM	39	32	13	60	16	4,387,886	86,047,453	2,221,788	943,820	533,774	.24
FED CATTLE	LRP	2	0	0	0	0	0	0	0	0	0	.00
FEEDEE CATTLE	LRP	5	3	2	6	3	1,760	2,108,858	37,607	4,887	41,436	1.10
LAMB	LRP	28	14	12	38	36	46,850	8,971,882	279,209	83,137	1,561,946	5.59
CALIFORNIA Total		74	49	27	104	55	4,436,496	97,128,193	2,538,604	1,031,844	2,137,156	.84
Grand Total		74	49	27	104	55	4,436,496	97,128,193	2,538,604	1,031,844	2,137,156	.84



Introduction

Strategic

Tactical

Operational

Ag Risks

Do It Yourself

RiskN

RIGHTRISK™

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Risk Controls

Market Risk - Production Risk - Institutional/Legal Risk - Human Risk - Financial Risk

Market Risk

- risk associated with the uncertainty around markets and prices for inputs and outputs

1. Livestock Prices

- USDA Agricultural Marketing Service - Colorado Weekly Summary
- USDA Agricultural Marketing Service - Montana Weekly Summary
- USDA Agricultural Marketing Service - New Mexico Combined Wild Avg - Cattle (weekly)
- USDA Agricultural Marketing Service - Washington Weekly Livestock Auction Summary
- USDA Agricultural Marketing Service - Wyoming Weekly Summary
- USDA Agricultural Marketing Service - Livestock and Beef
- USDA Agricultural Marketing Service - All
- Beef Basis - provides cattle producers with information and analytics to improve marketing decisions influenced by cattle basis risk.

2. Grain Prices

- USDA Agricultural Marketing Service - California Weekly Grain Report
- USDA Agricultural Marketing Service - Montana Cash Grain Prices
- USDA Agricultural Marketing Service - Utah Daily Grain Report
- USDA Agricultural Marketing Service - Eastern New Mexico Grain Report
- USDA Agricultural Marketing Service - Wyoming/Western Nebraska Elevator Grain Bids

3. Hay Prices

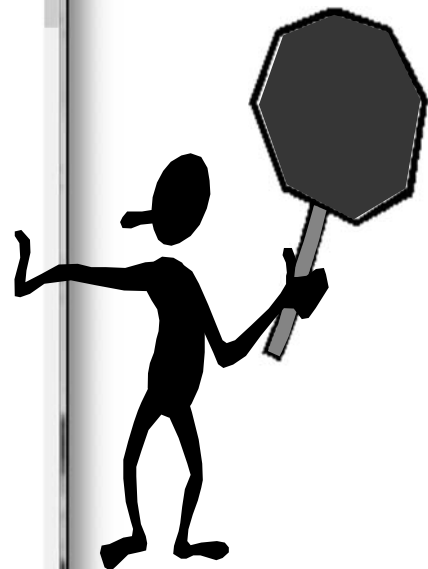
- USDA Agricultural Marketing Service - California Weekly Hay Report
- USDA Agricultural Marketing Service - Colorado Weekly Hay Report
- USDA Agricultural Marketing Service - Idaho Weekly Hay Report
- USDA Agricultural Marketing Service - Montana Weekly Hay Report
- USDA Agricultural Marketing Service - New Mexico Weekly Hay Report
- USDA Agricultural Marketing Service - Oregon Weekly Hay Report
- USDA Agricultural Marketing Service - Utah Weekly Hay Market Report
- USDA AMS - Washington-Oregon (Columbia Basin) Weekly Hay
- USDA AMS - Wyoming, West Nebraska, and SW South Dakota Hay Report (weekly)
- USDA Agricultural Marketing Service - Wyoming Weekly Summary

4. Lease Rates/Grazing Fees

- USDA AMS - Wyoming, West Nebraska and SW Dakota Grazing Fee Report
- USDA National Agricultural Statistics Service - Cash Rents by County

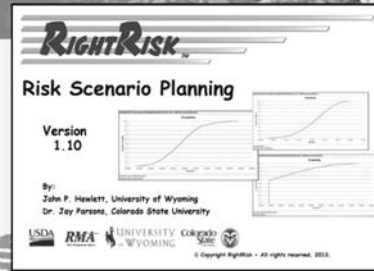
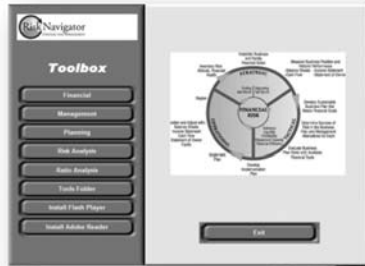
5. Price Protection (Insurance)

- USDA Risk Management Agency - Livestock Insurance - background information



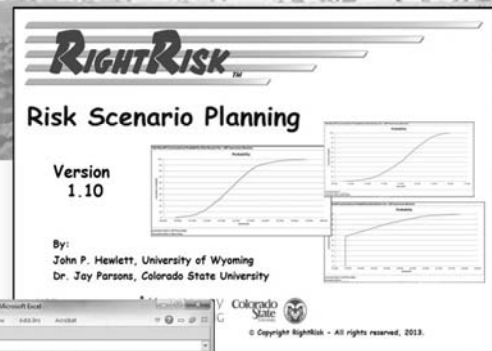
<http://RightRisk.org/controls>

Evaluating Alternatives



Tools to Evaluate Alternatives

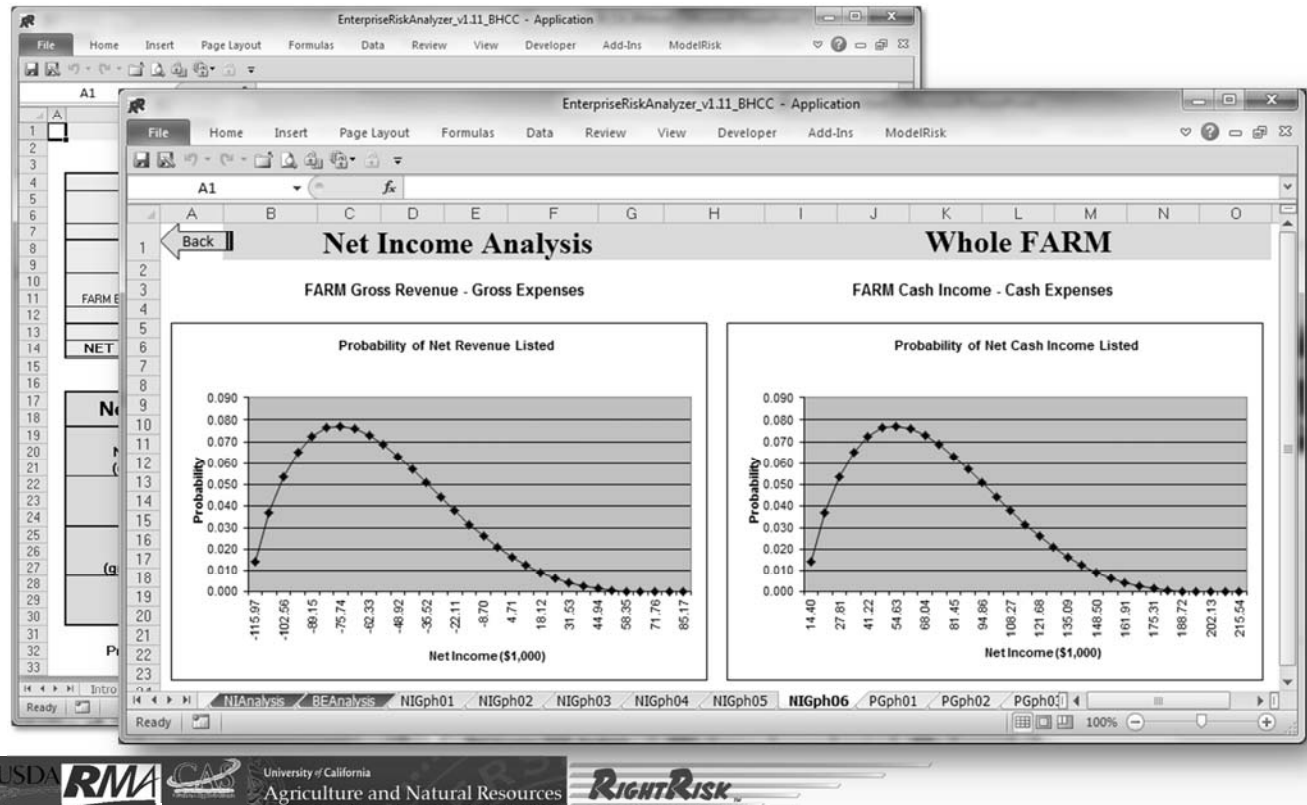
- Risk Scenario Planner *relatively minor changes*
- Enterprise Budget *larger changes*
- Whole Farm Budget *substantial changes*



<http://RightRisk.org/tools>

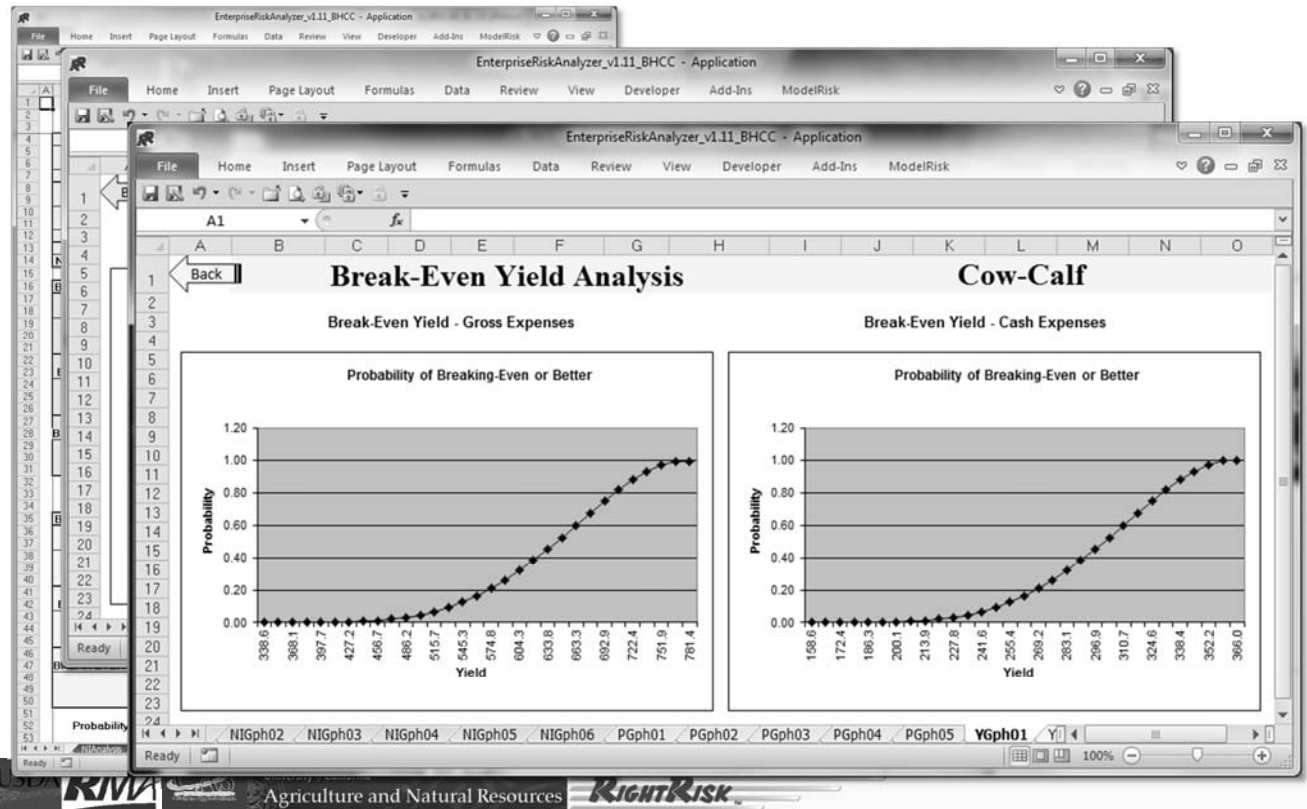
Enterprise Risk Analyzer

Net Return Analysis



Enterprise Risk Analyzer

Breakeven Analysis



Whole Farm Budget

Introduction Enter Data Financial Statements Ratios Credit Scoring **Family Living, Revenues, Expenses**

Adobe Flash Player 10

File View Control Help

Introduction Enter Data Financial Statements Ratios Credit Scoring **Family Living, Revenues, Expenses**

Off/On **Liquidity**

	Beginning	Ending
Current Ratio	7.26	8.21
Working Capital	\$215,552	\$248,383

Off/On **Solvency**

Debt/Asset Ratio	0.179	0.172
Equity/Asset Ratio	0.821	0.828
Debt/Equity Ratio	0.22	0.208

Off/On **Profitability** <<<Accrual Basis Income Statement>>> Ending

Rate of Return on Business Assets	4.96%
Rate of Return on Business Equity	4.58%
Operating Profit Margin Ratio	0.13
Net Business Income	\$110,890

Off/On **Repayment Capacity**

Term Debt and Capital Lease Coverage Ratio	2.37
Capital Replacement and Term Debt Repayment Margin	\$33,482

Off/On **Financial Efficiency**

Asset Turnover Ratio	0.38
Operating Expense Ratio	0.73
Depreciation Expense Ratio	0.06
Interest Expense Ratio	0.03
Net Farm Income From Operations Ratio	0.18

Check Sum 100.00%

Save, Load, Delete

Statement - Accrual Adj. Income

Income (Net of cull lvsst sales)	\$554,721
Income Adjustments	0
Income (Raised Brdo Lvst)	17,500
Gain/Loss on Breeding Lvst (Net)	140
Gross Revenue	\$572,361
Expense	425,848
Expense (Excluding Interest)	0
Feed Inventory Adjustment	0
Non-Cash Non-Interest Expense	0
ation (Land, Bldgs, Equip.)	65,500
Total Operating Expense	491,348
Exp. - T.D. & C.L.	28,759
Exp. - Operating	8,027
Interest Expense	(3,455)
Total Expense	\$524,679
Business Income From Operations	47,681
Business Income	47,681
SS+Def. Tax--Cash & Non-Cash	0
Time	\$47,681

Accrual

Statement of Owner Equity

Beginning Net Worth (Cost/Mkt)	3,548,356
Time	47,681
Business Cash Inflows	0
Withdrawals (Cash)	50,000
Situation Change/Cont./Distrib.	\$0
Ending Net Worth	3,546,037
Ending Net Worth (Cost/Mkt)	3,546,037
Discrepancy	\$0

Save, Load, Delete

Percent Crop Cost of Production 100%

Percent Livestock Cost of Production 100%

Percent Government Payments 100%

Off/On **Income Tax Off/On**

Reset Print Cash Income Toggle Off/On Deferred Taxes Off/On Income Tax Off/On

Mouse Over for Help

Owner Withdrawals \$100,000

Nonfarm Inflows #1 \$0

Nonfarm Inflows #2 0

Percent Crop Revenue 100%

Percent Livestock Revenue 100%

Percent Operating Expenses Borrowed 50%

Percent Crop Cost of Production 100%

Percent Livestock Cost of Production 100%

Percent Government Payments 100%

Mouse Over to see Ratio Formulas.

Risk Navigator Tool Box

Risk Navigator
STRATEGIC RISK MANAGEMENT

Toolbox

- Financial
- Management
- Planning
- Risk Analysis
- Ratio Analysis
- Tools Folder
- Install Flash Player
- Install Adobe Reader
- Exit

Inventory Risk Attitude, Financial Health

Establish Business and Family Financial Goals

Measure Business Position and Historic Performance
-Balance Sheets
-Income Statement
-Cash Flow
-Statement of Owner

STRATEGIC

Ending Net Worth Beginning Net Worth

Replan

Develop Sustainable Business Plan that Meets Financial Goals

FINANCIAL RISK

Determine Sources of Risk in the Business Plan and Management Alternatives for Each

Solvency Liquidity Profitability Repayment Capacity Financial Efficiency

OPERATIONAL

Monitor and Adjust with:
-Balance Sheets
-Income Statement
-Cash Flow
-Statement of Owner Equity

Evaluate Business Plan Risks with Available Financial Tools

Implement Plan

Develop Implementation Plan

TACTICAL

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