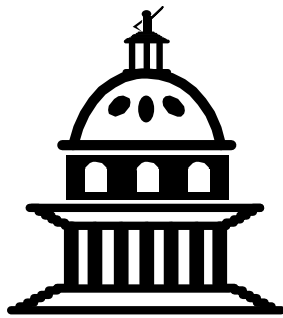


IMPACT OF DROUGHT ON TEXAS AGRICULTURE

AFPC Policy Briefing Series 98-4

July 1998



AFPC

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TEXAS A&M UNIVERSITY SYSTEM**

Agricultural and Food Policy Center
Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Agricultural Extension Service
Texas A&M University

Web Site: <http://AFPC1.TAMU.EDU>

IMPACT OF DROUGHT ON TEXAS AGRICULTURE

AFPC Policy Briefing Series 98-4

Ronald D. Knutson
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AFPC Briefing Series

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College Station, TX 77843-2124

or call 409-845-5913.

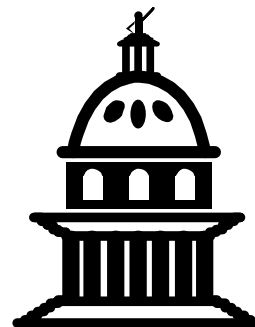
Impact of Drought on Texas Agriculture

Briefing for Secretary of Agriculture
College Station, Texas
July 29, 1998

Ronald D. Knutson

Edward G. Smith

Roland D. Smith



AFPC

AGRICULTURAL & FOOD POLICY CENTER
TEXAS A&M UNIVERSITY SYSTEM

Status of Federal Farm Policy

- ☞ **Lump sum payments**
 - Higher than would have been under target price through 1998
 - Indeterminate through 2002
 - Increased diversification resulting from flexibility provisions

- ☞ **Crop Insurance**
 - Most common coverage is approximately 50% yield (CAT or limited additional)

- ☞ **1998 situation particularly unfavorable for Texas**
 - Reduced yield
 - Depressed prices
 - Compounded by 1996 adversities

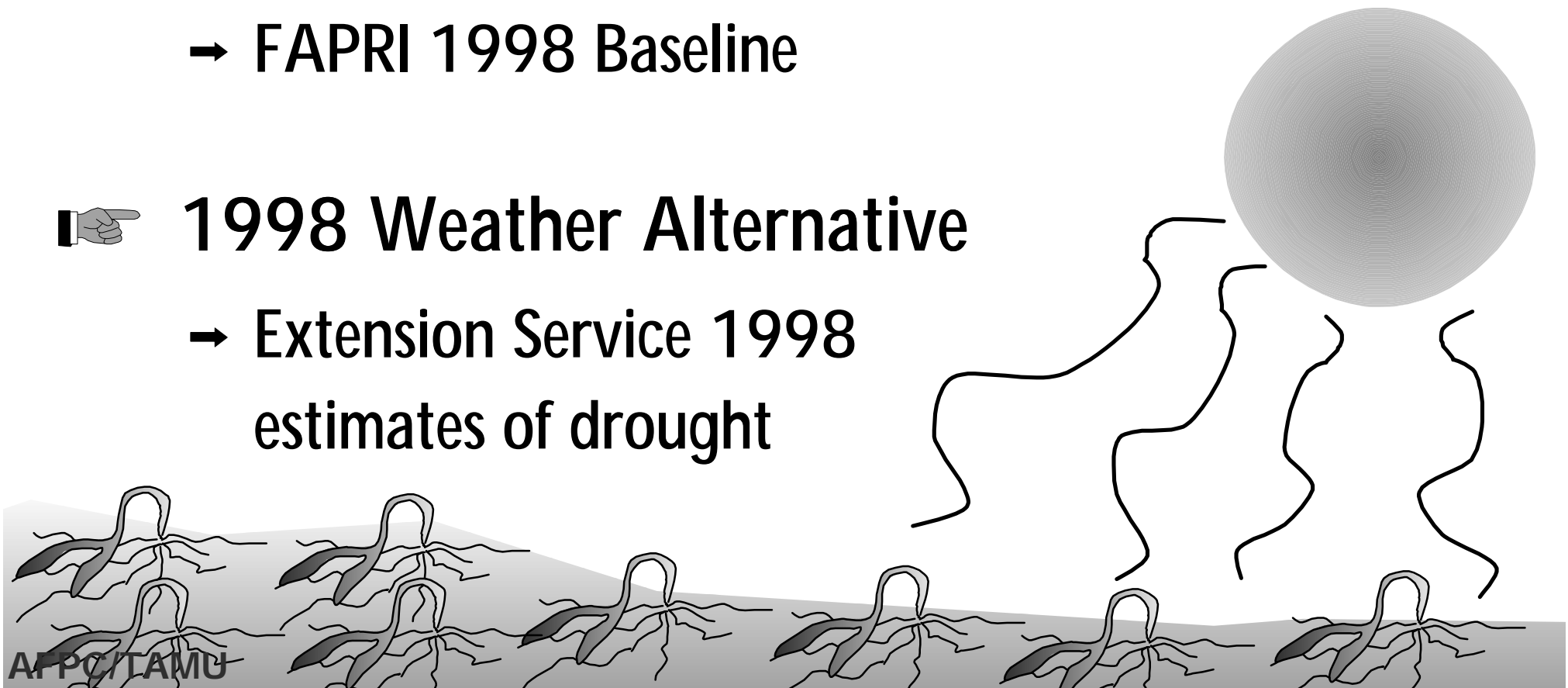
Impact of 1998 Weather Adversities: Assumptions

👉 BASELINE

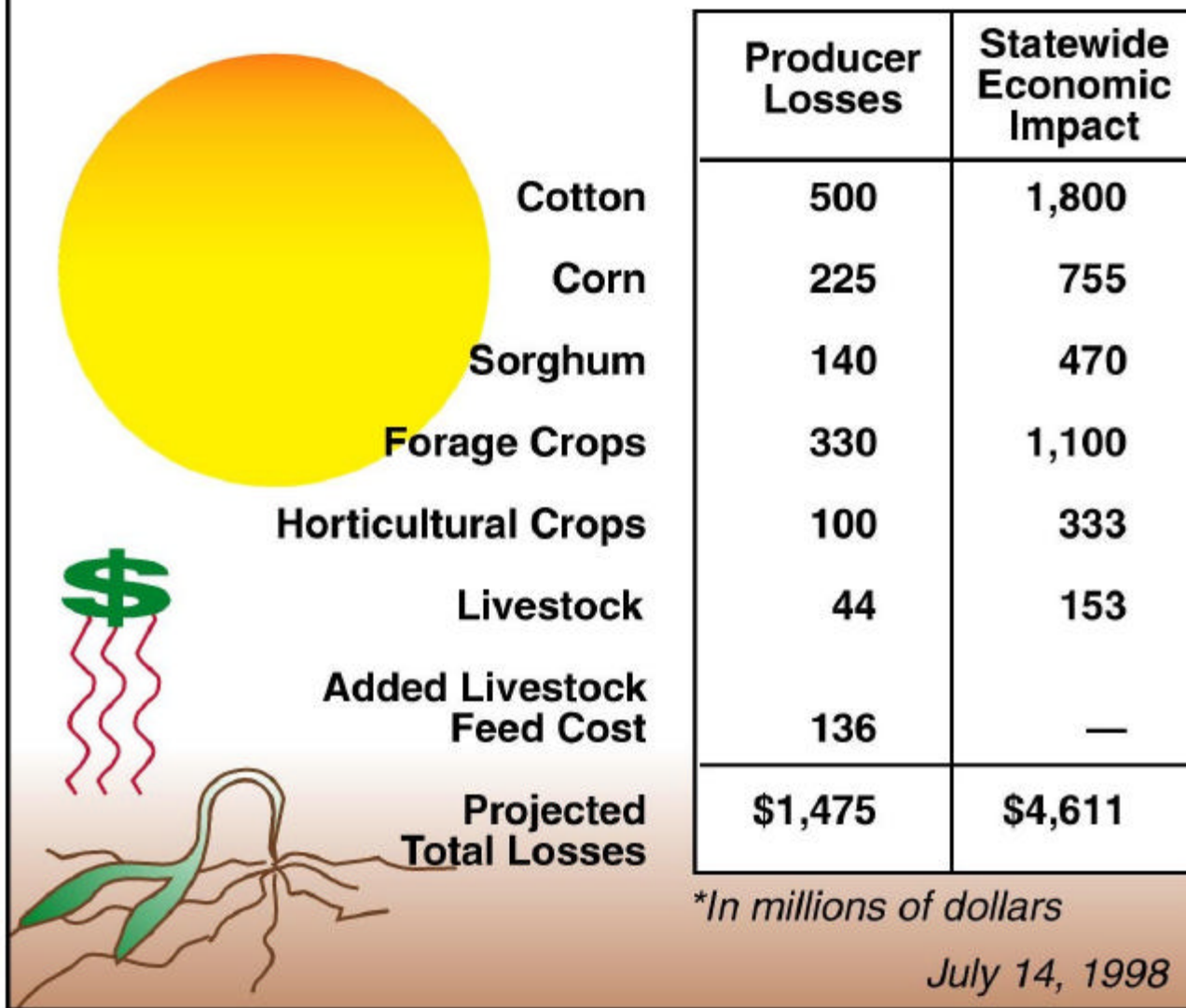
- TASS 1996 production conditions
- FAPRI 1998 Baseline

👉 1998 Weather Alternative

- Extension Service 1998 estimates of drought



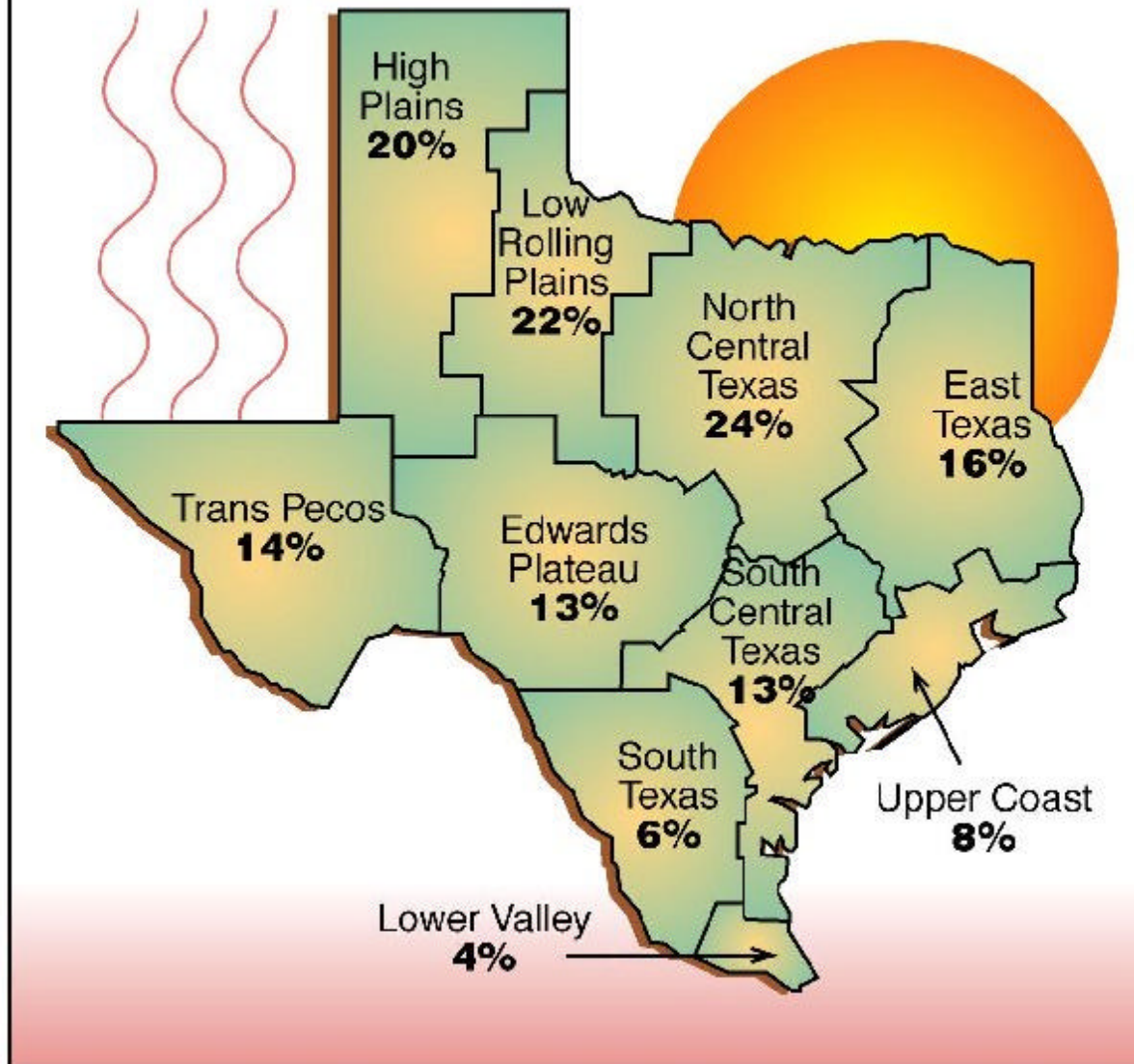
1998 Texas projected economic loss from drought for selected commodities*



Graphic: Agricultural Communications, The Texas A&M University System
 Source: Texas Agricultural Extension Service

Texas precipitation, April-June, 1998

Percent of normal by climatic regions

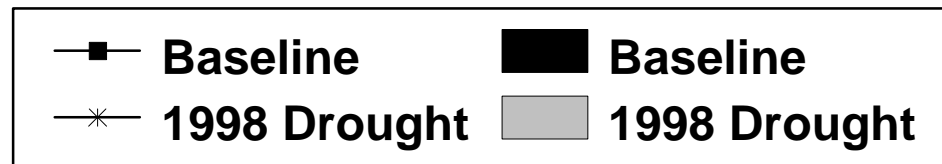
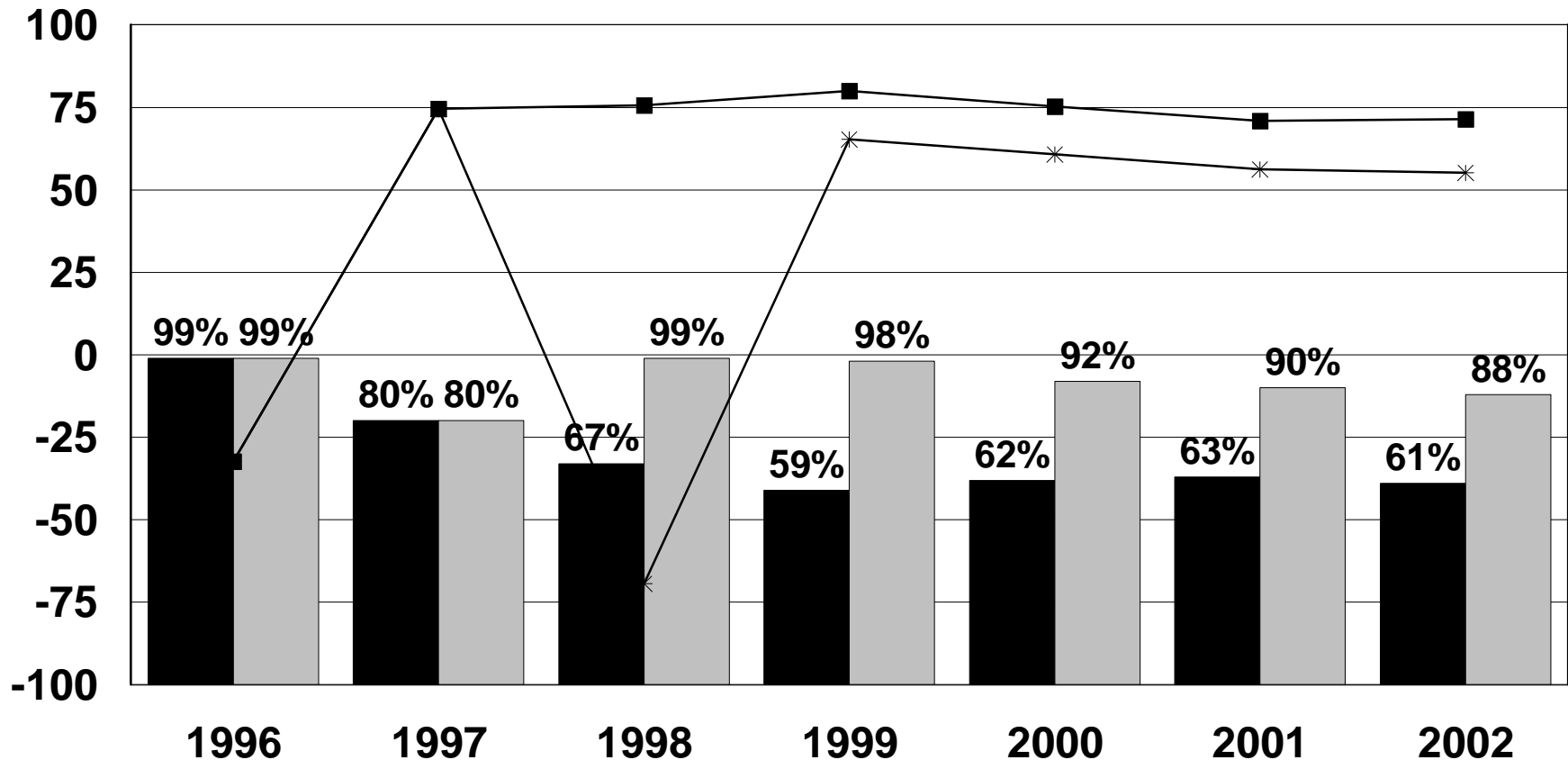


Graphic: Agricultural Communications, The Texas A&M University System
Source: National Weather Service and Texas Agricultural Statistics Service

Texas Southern Plains Moderate Cotton Farm

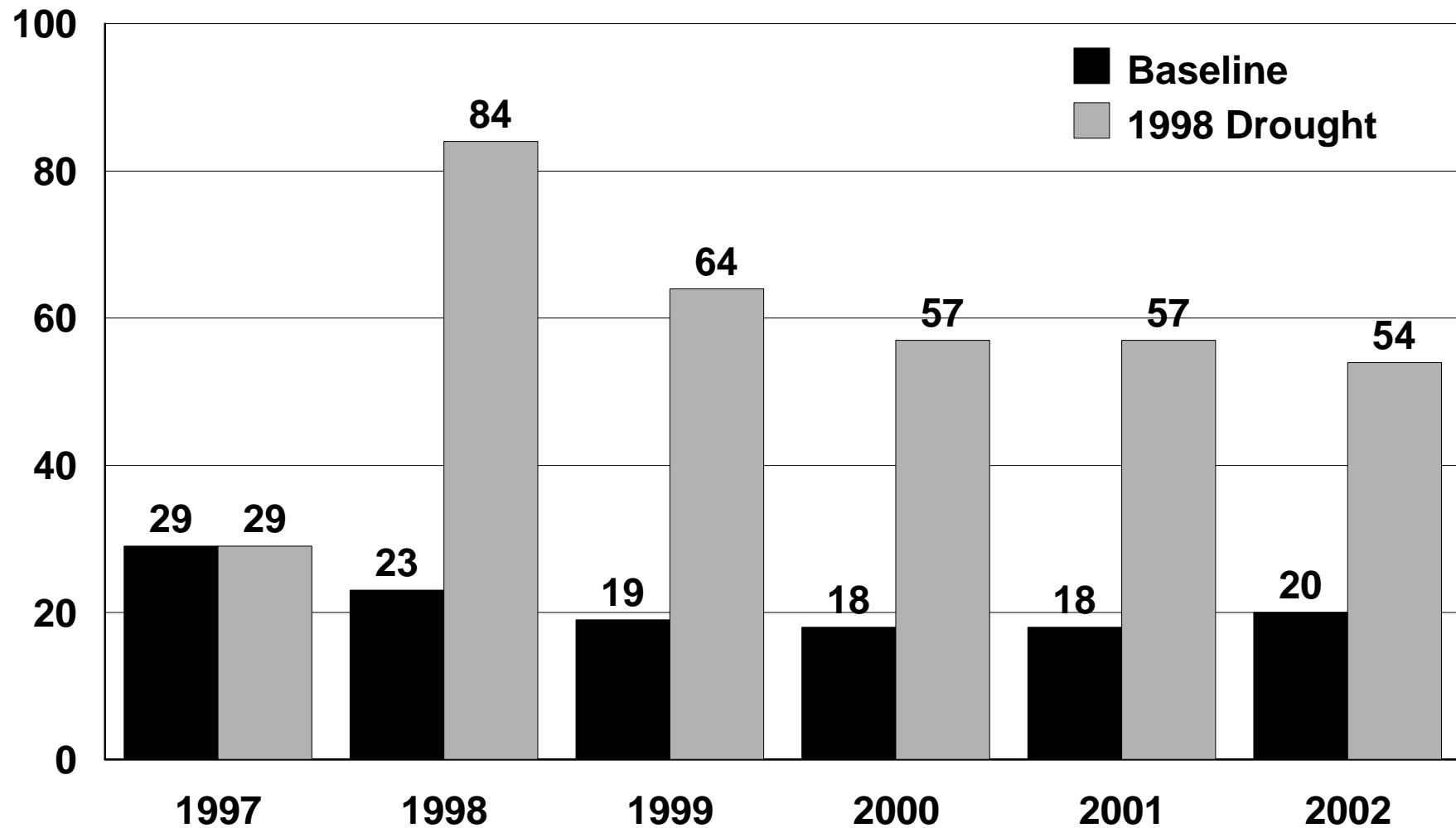
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Southern Plains Moderate Cotton Farm

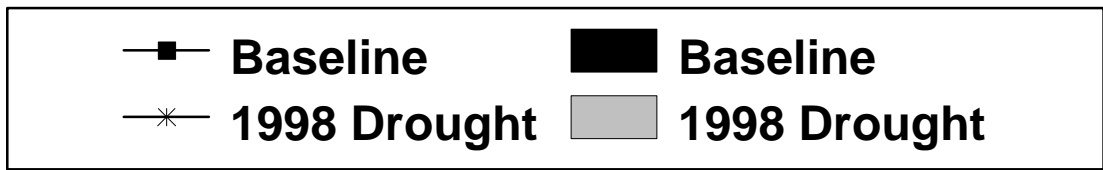
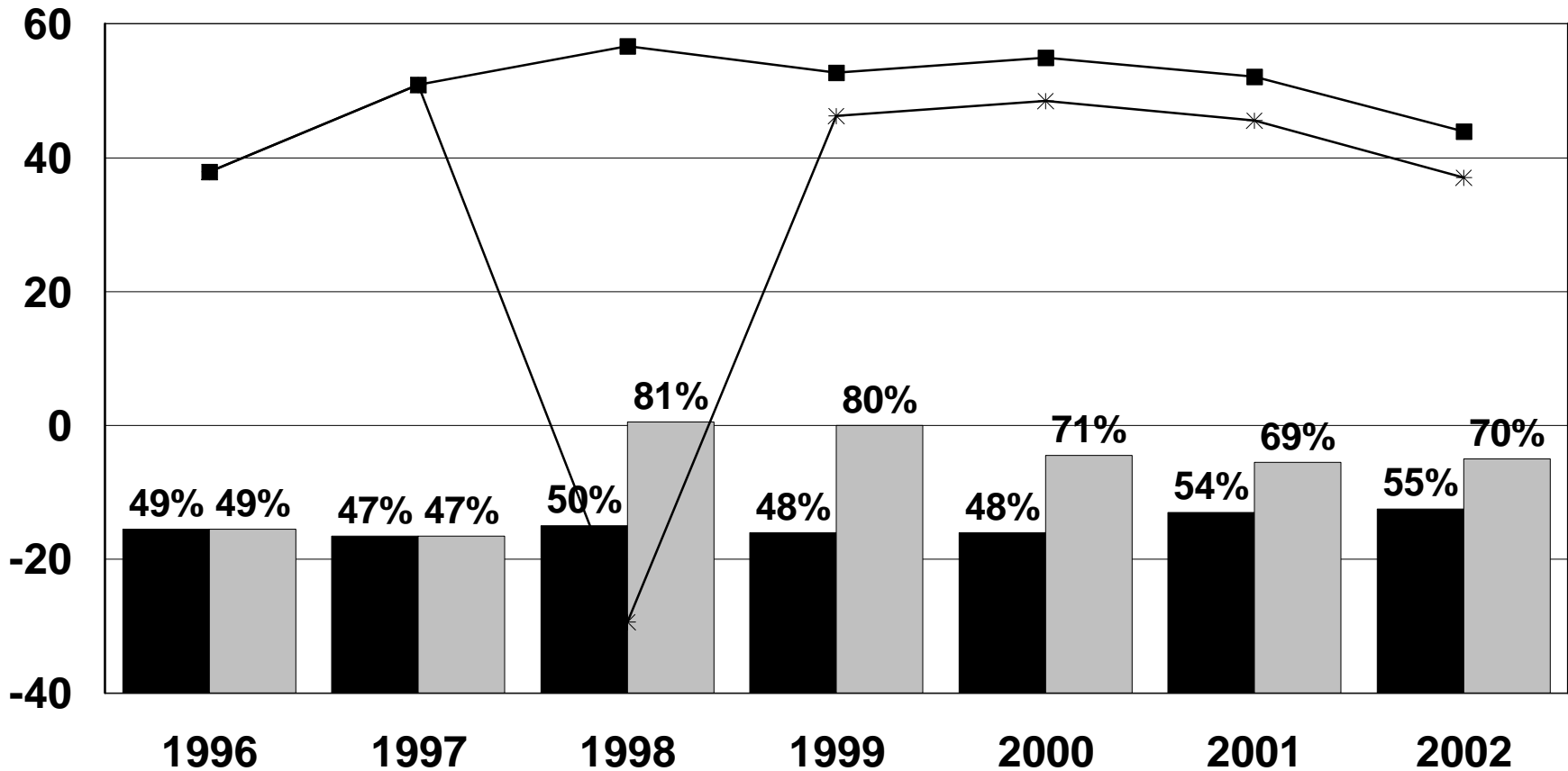
Probability of Losing Real Net Worth (%)



Texas Rolling Plains Cotton Farm

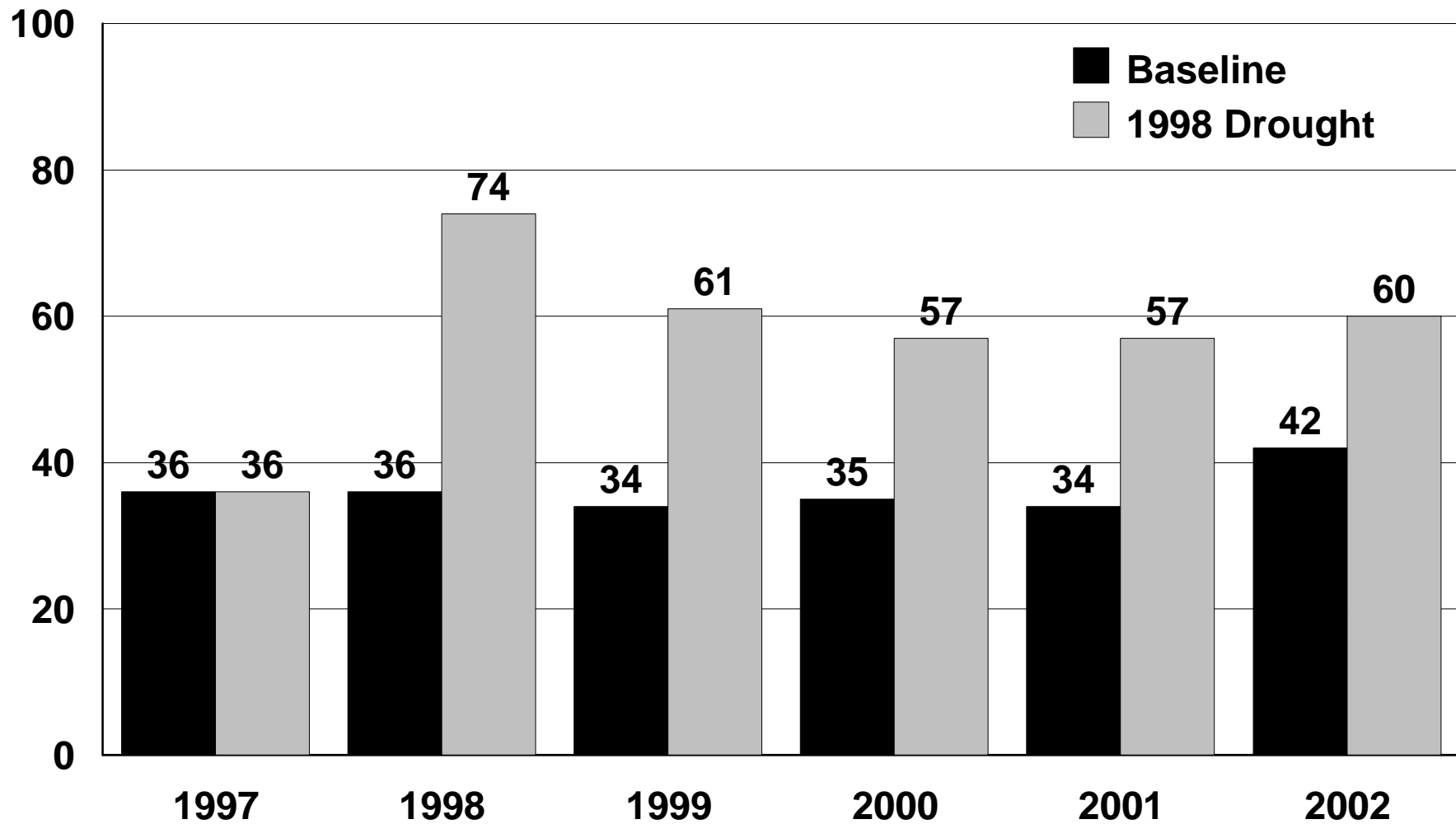
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Rolling Plains Cotton Farm

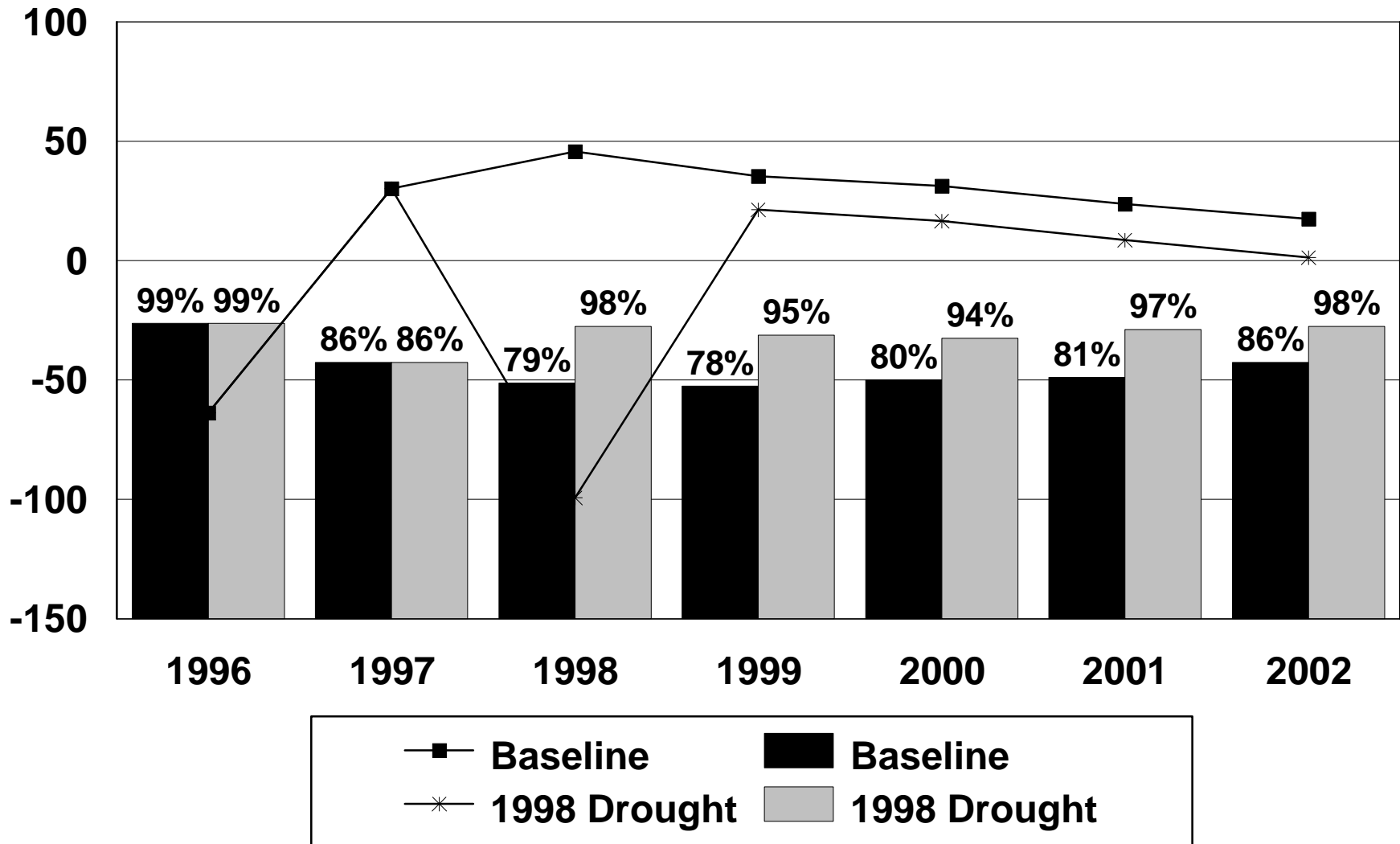
Probability of Losing Real Net Worth (%)



Texas Coastal Bend Cotton Farm

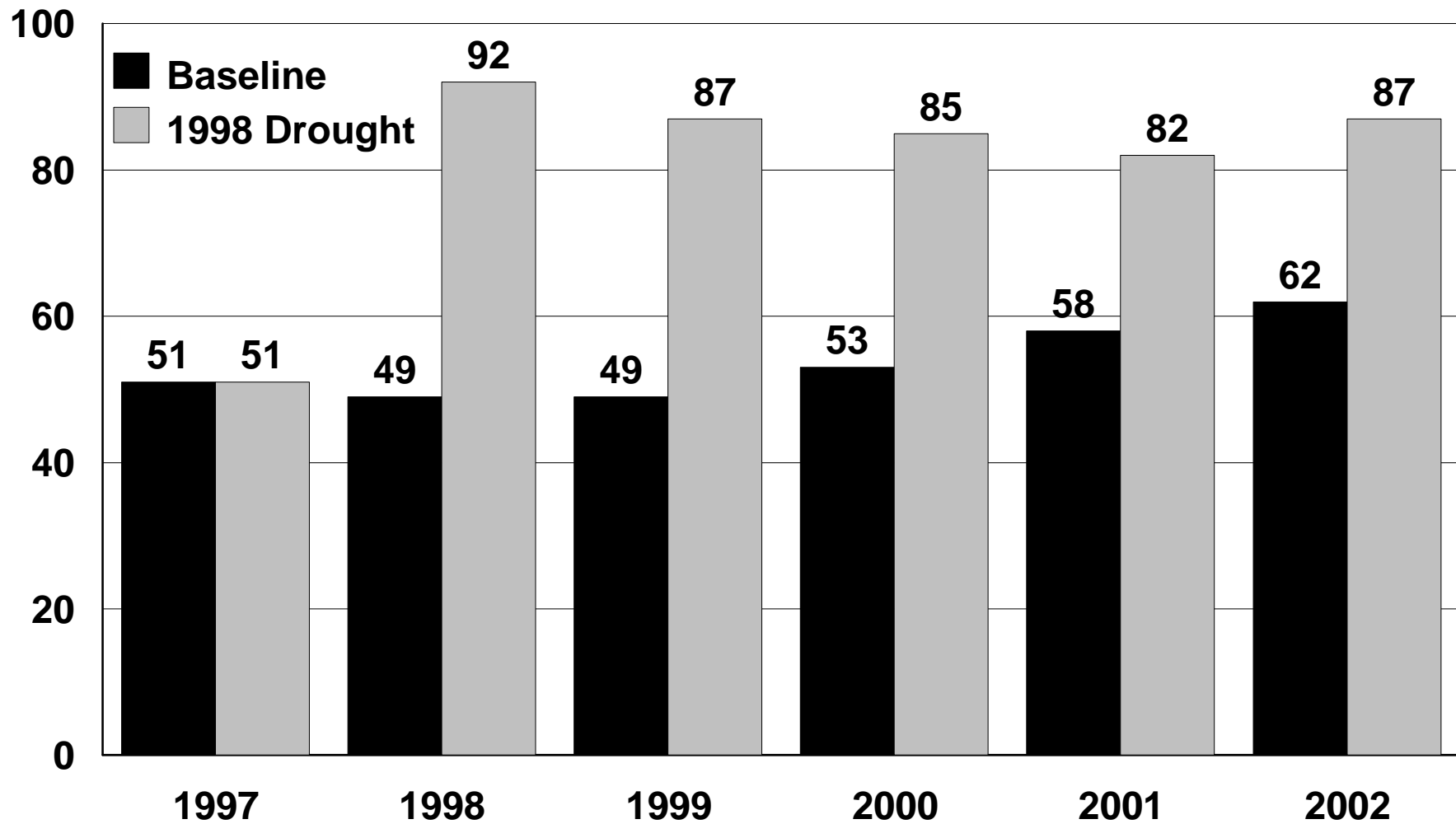
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Coastal Bend Cotton Farm

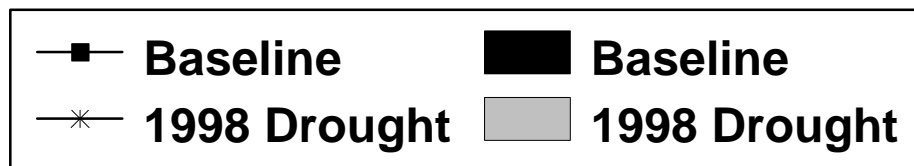
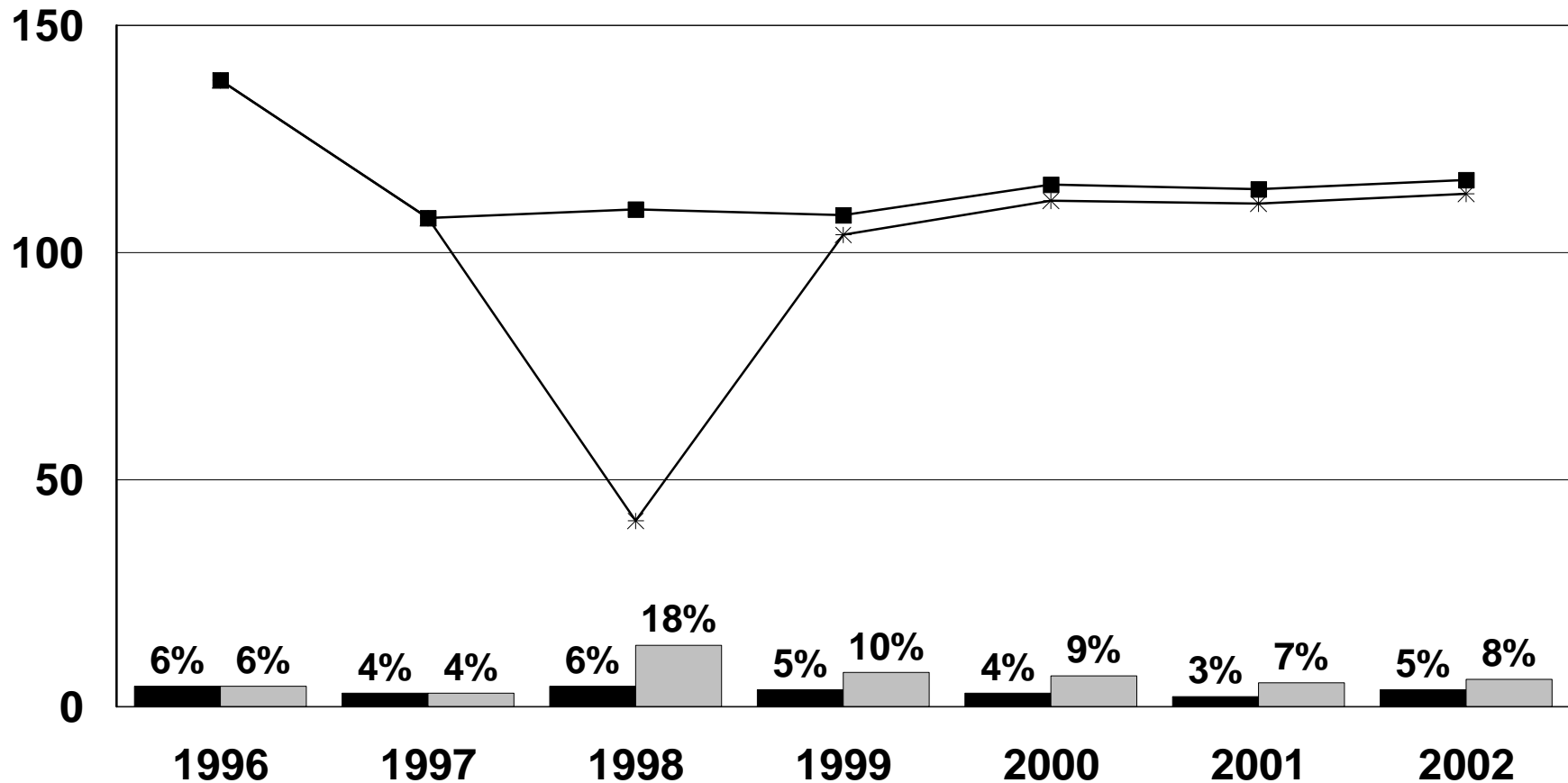
Probability of Losing Real Net Worth (%)



Texas Northern Plains Moderate Grain Farm

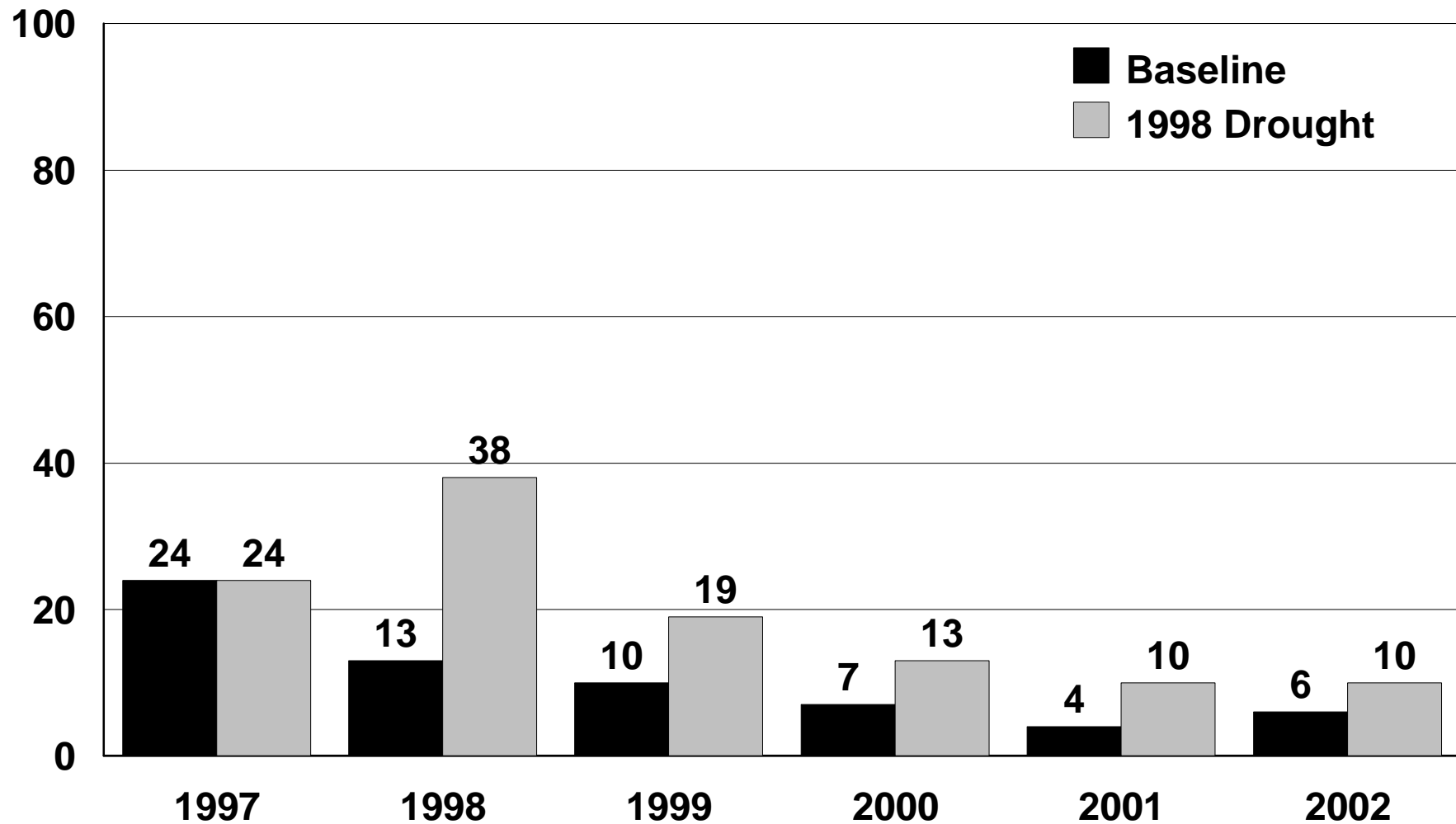
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Northern Plains Moderate Grain Farm

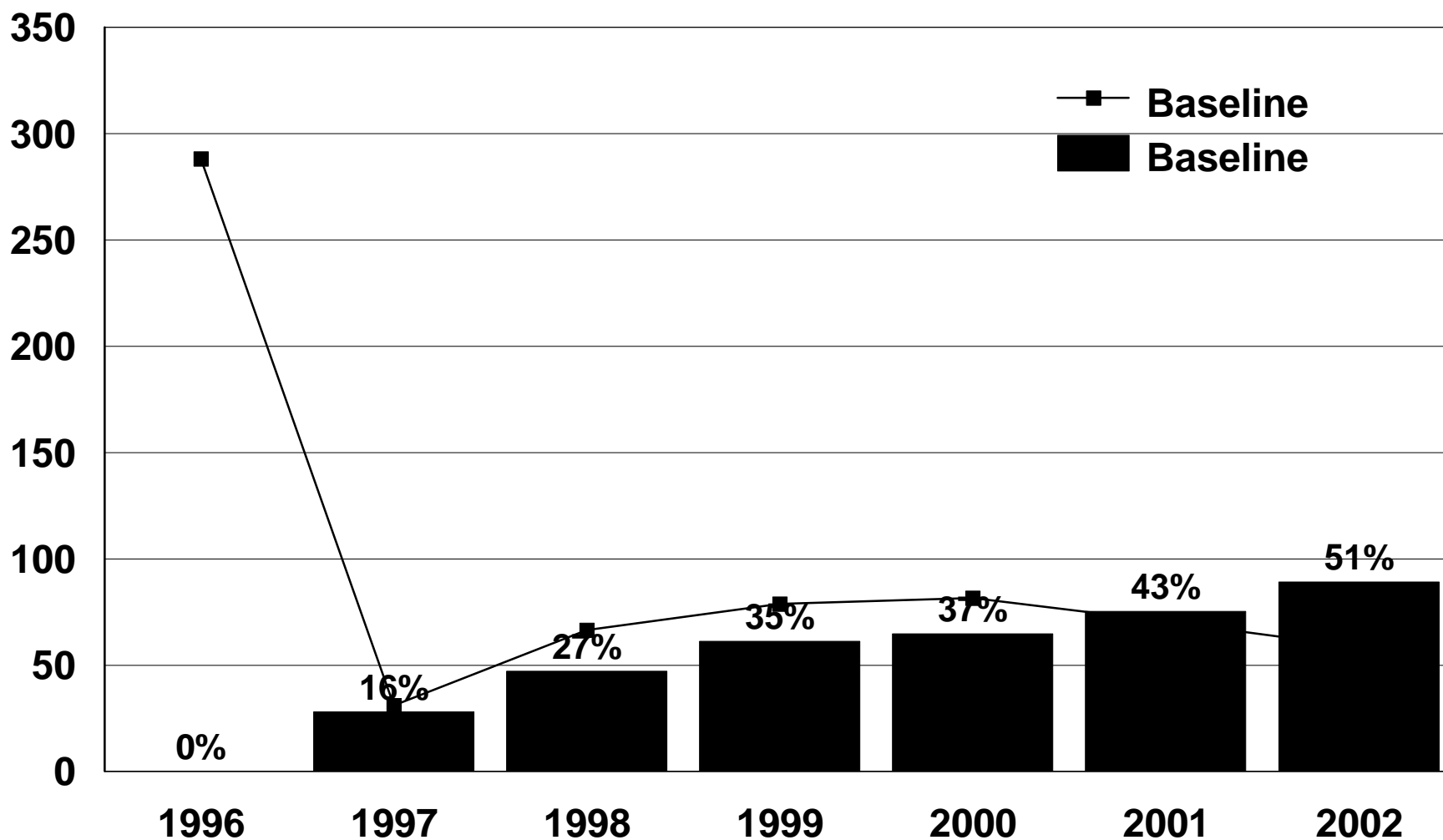
Probability of Losing Real Net Worth (%)



Central Texas Moderate Dairy

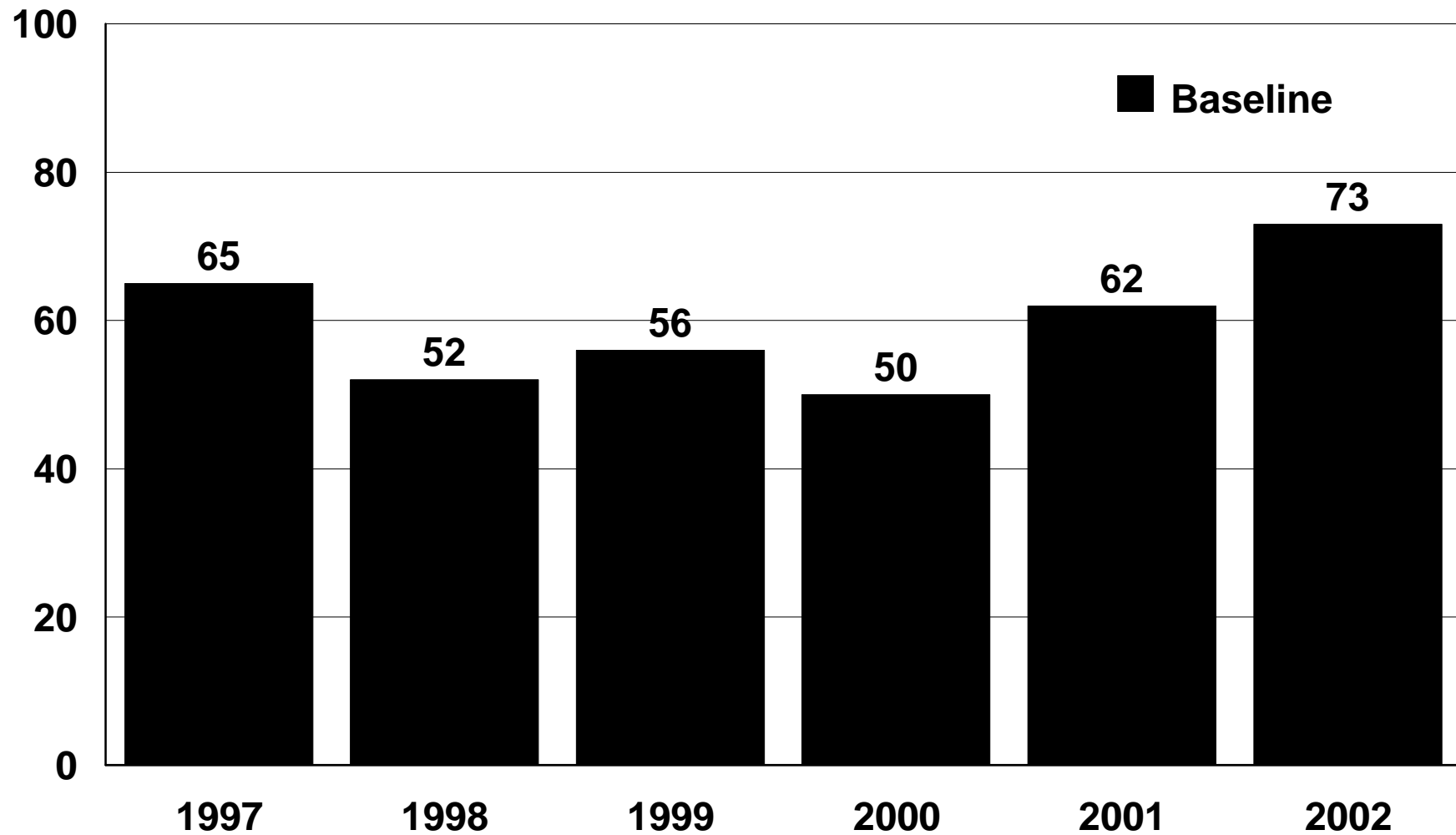
Net Cash Farm Income (\$1,000)

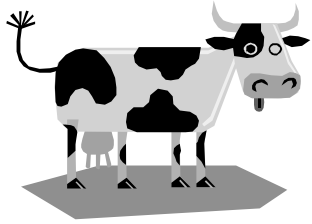
Probability of Refinancing Deficits (%)



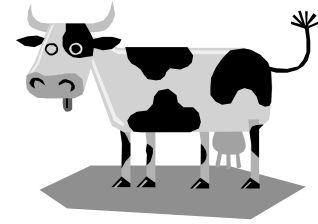
Central Texas Moderate Dairy

Probability of Losing Real Net Worth (%)





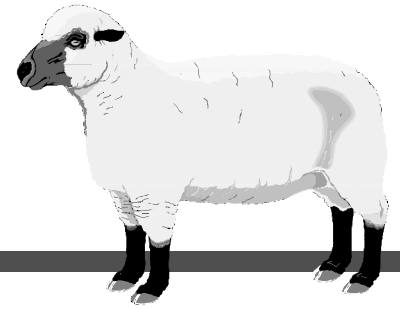
Dairy



-
- ☞ **1998 vs. 1996 Drought**
 - Feed prices much more expensive in 1996
 - Milk production normally declines during summer heat
 - ☞ **Erath County Representative Dairies**
 - Moderate size dairy (400 cows) must change structure to survive over baseline period
 - Large dairy (825 cows) is profitable under the baseline
 - ☞ **Hopkins County Representative Dairies**
 - Area lost more than 30% of producers in last 4 years
 - Moderate size dairy (210 cows) is profitable under baseline but only most efficient producers remain
 - 210 cow dairy not profitable enough to move to next generation ---> continued change will occur
 - Large dairy (650 cows) is profitable under baseline



Cattle and Sheep



Cycle

- Inventory liquidation phase of cycle
- Texas producers caught trying to rebuild herd from 1996 drought
- Tx producers relatively less ability to begin to respond to higher anticipated cattle prices as supplies contract due to drought



Other issues

- Reduced weaning weights
- Reduced conception rates
- Lower feed prices relative to 1996

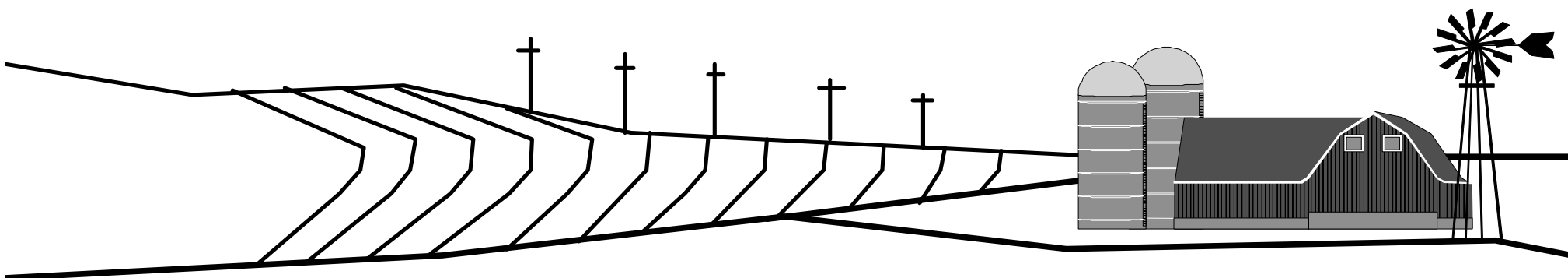


Sheep

- 1996 drought factor in 1996 inventory decline
- Reduced lambing rates and weights
- Drought on top of adjustments to program changes

FARM Assist Pilot Program

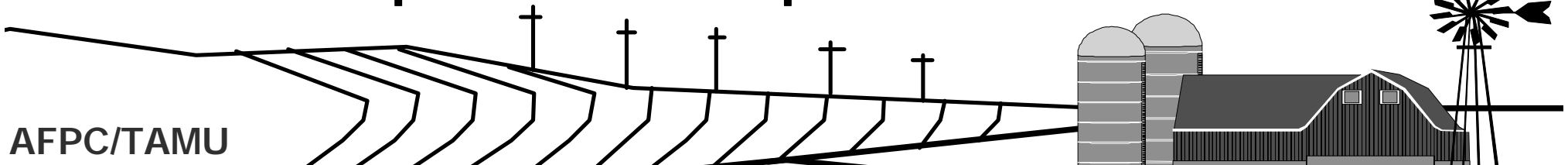
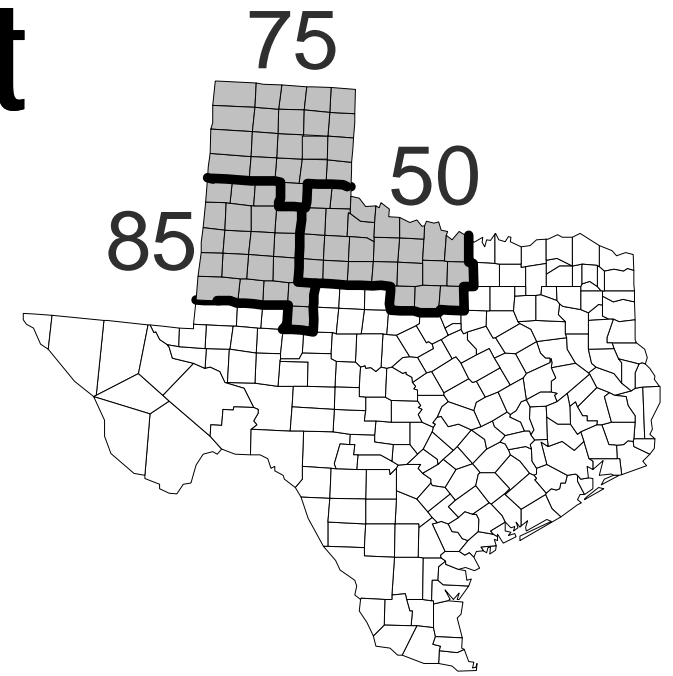
A whole farm *strategic planning tool* designed to provide farmers and ranchers the flexibility to *proforma analyze their operation under risk* employing a wide array of risk management tools.



FARM Assist

☞ How will it work?

- Pilot Regions
- One-on-one assistance
- Risk Management Specialist
- Professional Report
 - Specifically tailored to each subscriber
 - Delivered and explained
- Fee based
- Database
- Subscriptions start September 1, 1998



Implications

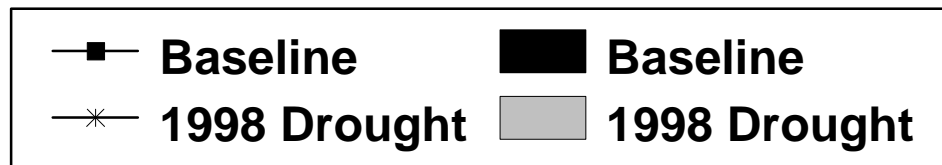
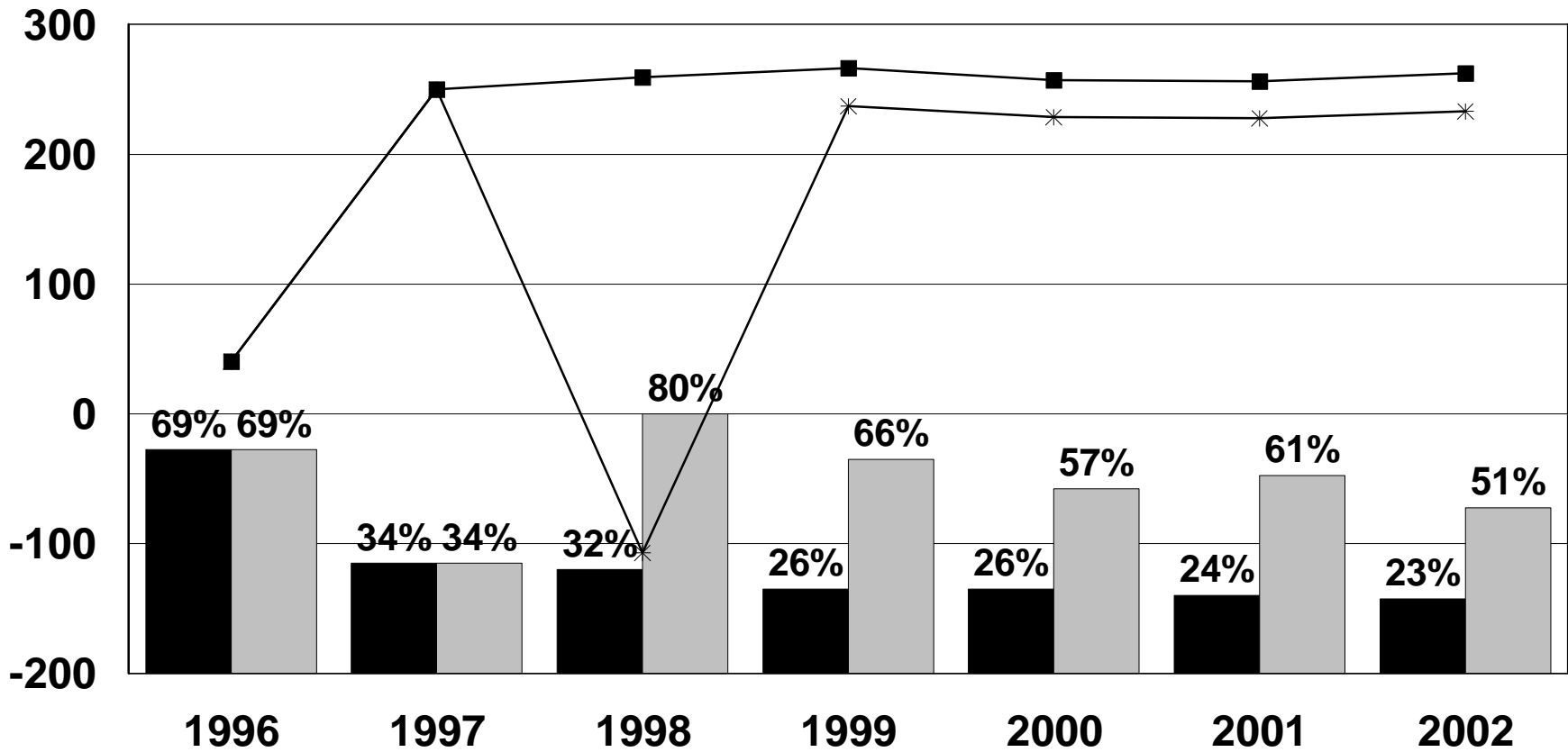
- 👉 **Dryland farmers in big trouble**
 - Affects whole agriculture community
- 👉 **Relative benefits of 1996 Farm Bill indeterminate over full life of bill**
 - Need strong export demand to fulfill objectives
- 👉 **Producers must be able to assess risk management alternatives**

Appendix

Texas Southern Plains Large Cotton Farm

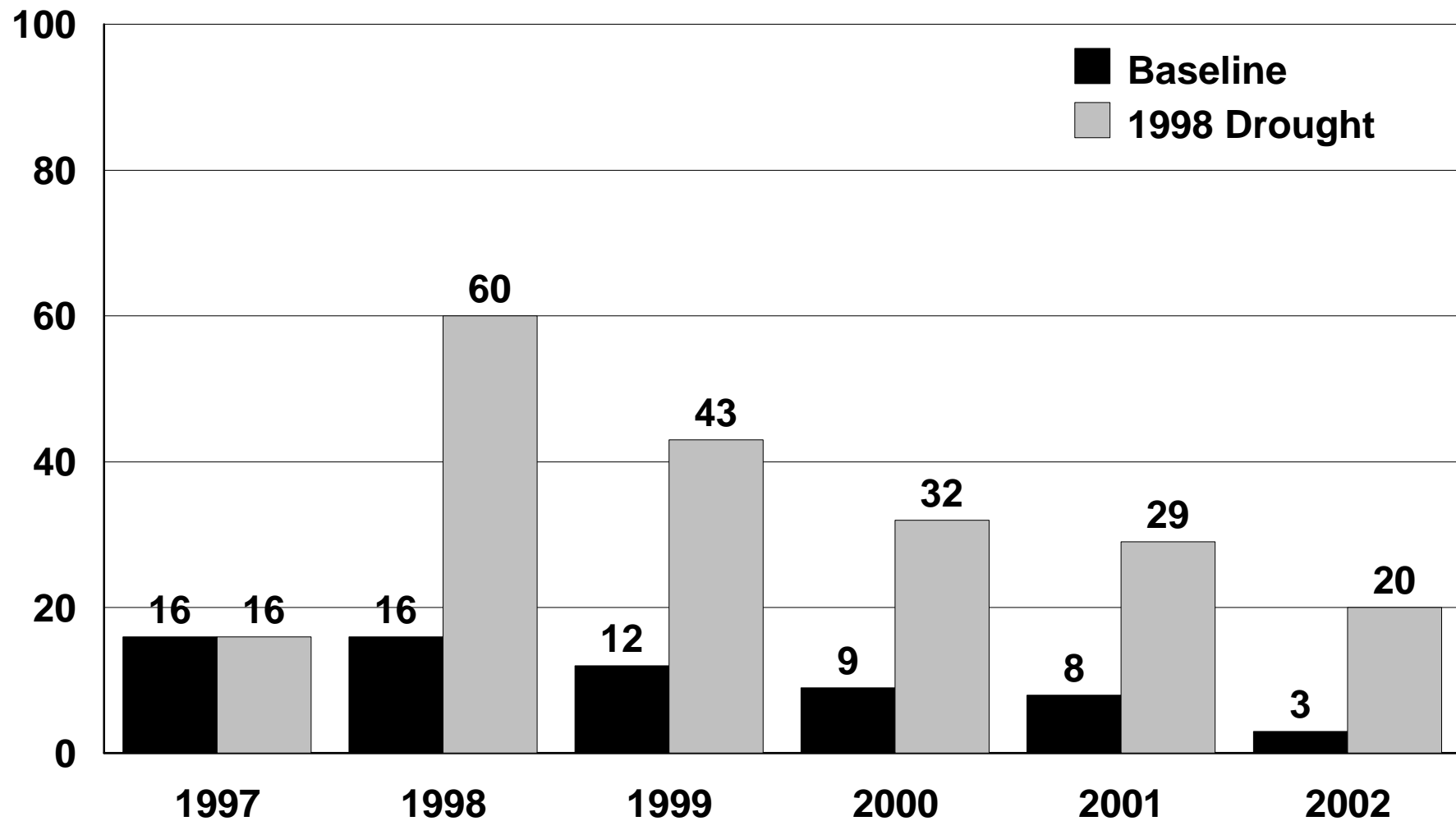
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Southern Plains Large Cotton Farm

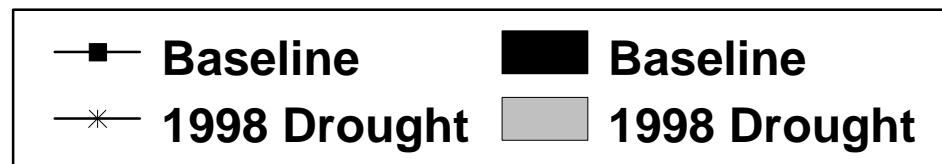
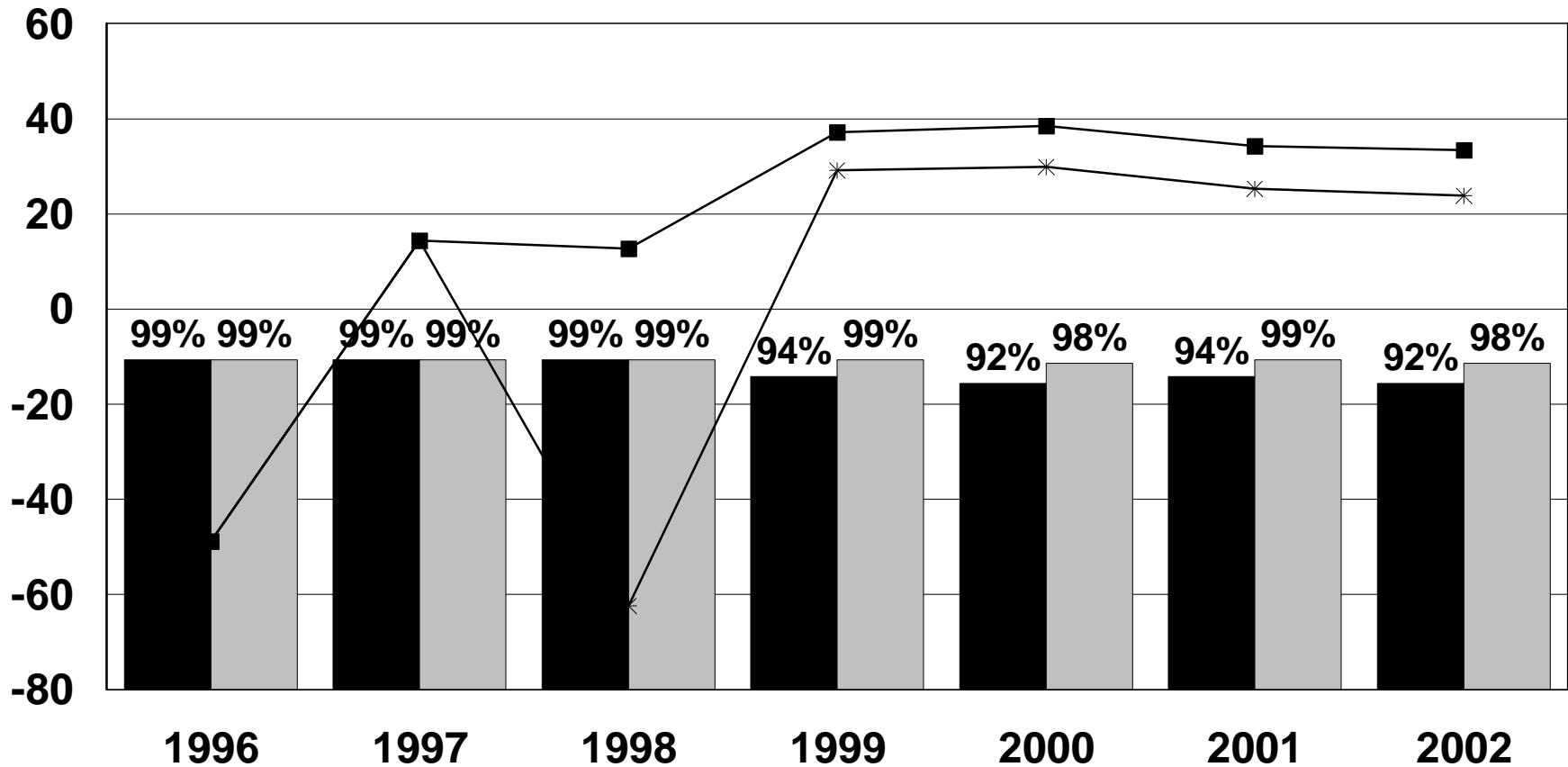
Probability of Losing Real Net Worth (%)



Texas Blackland Cotton Farm

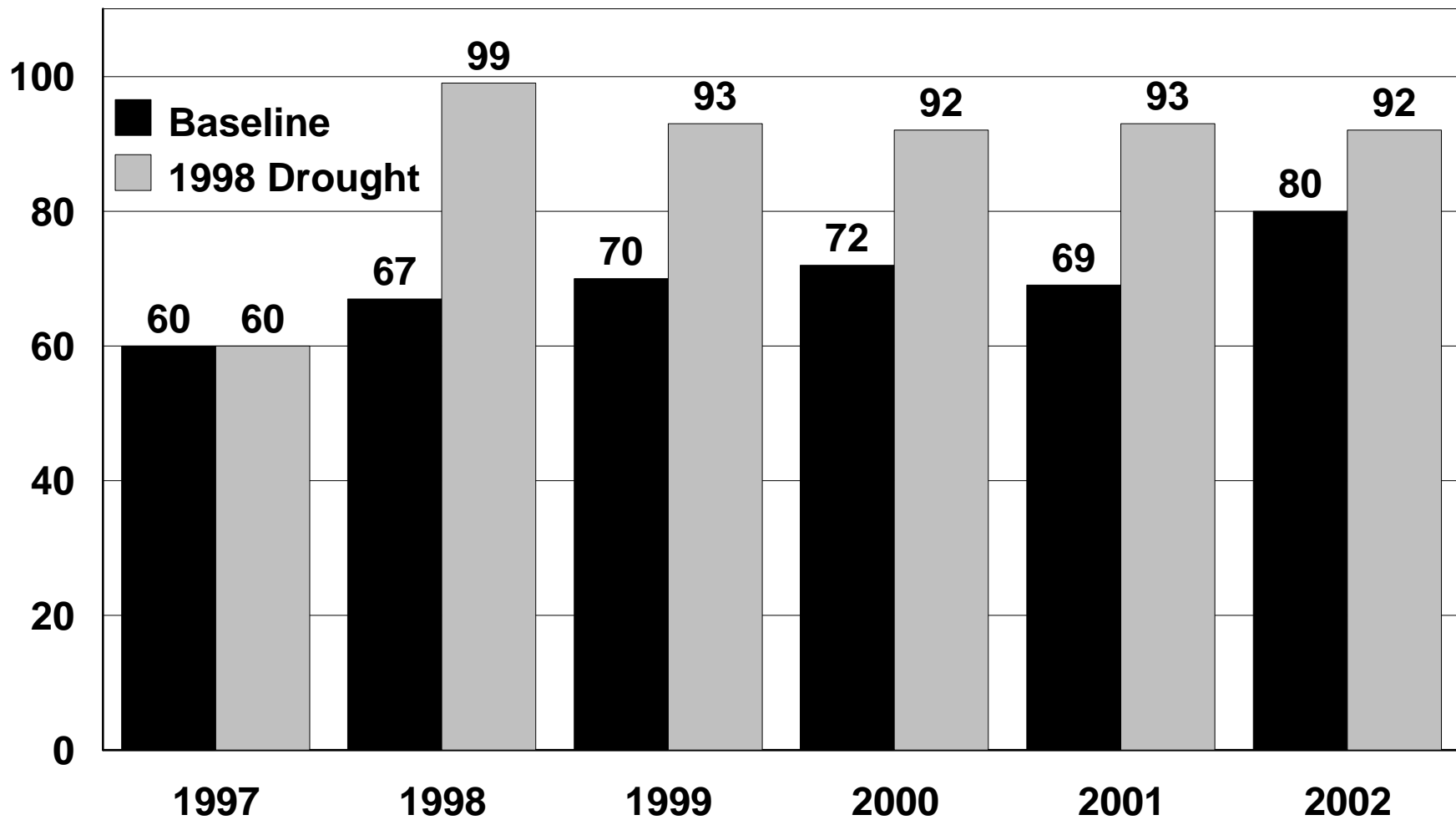
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Blackland Cotton Farm

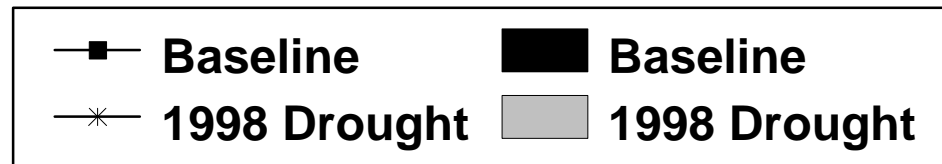
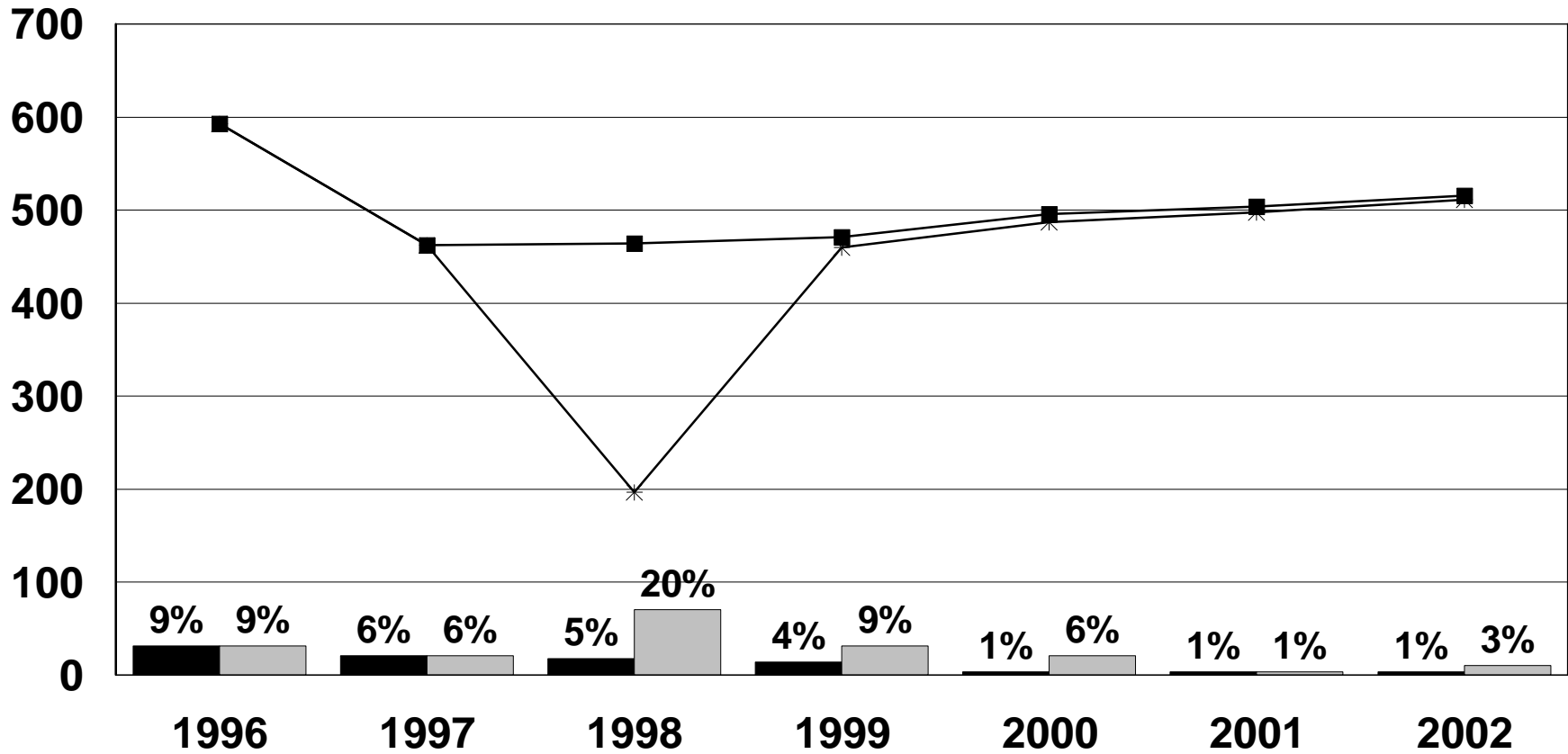
Probability of Losing Real Net Worth (%)



Texas Northern Plains Large Grain Farm

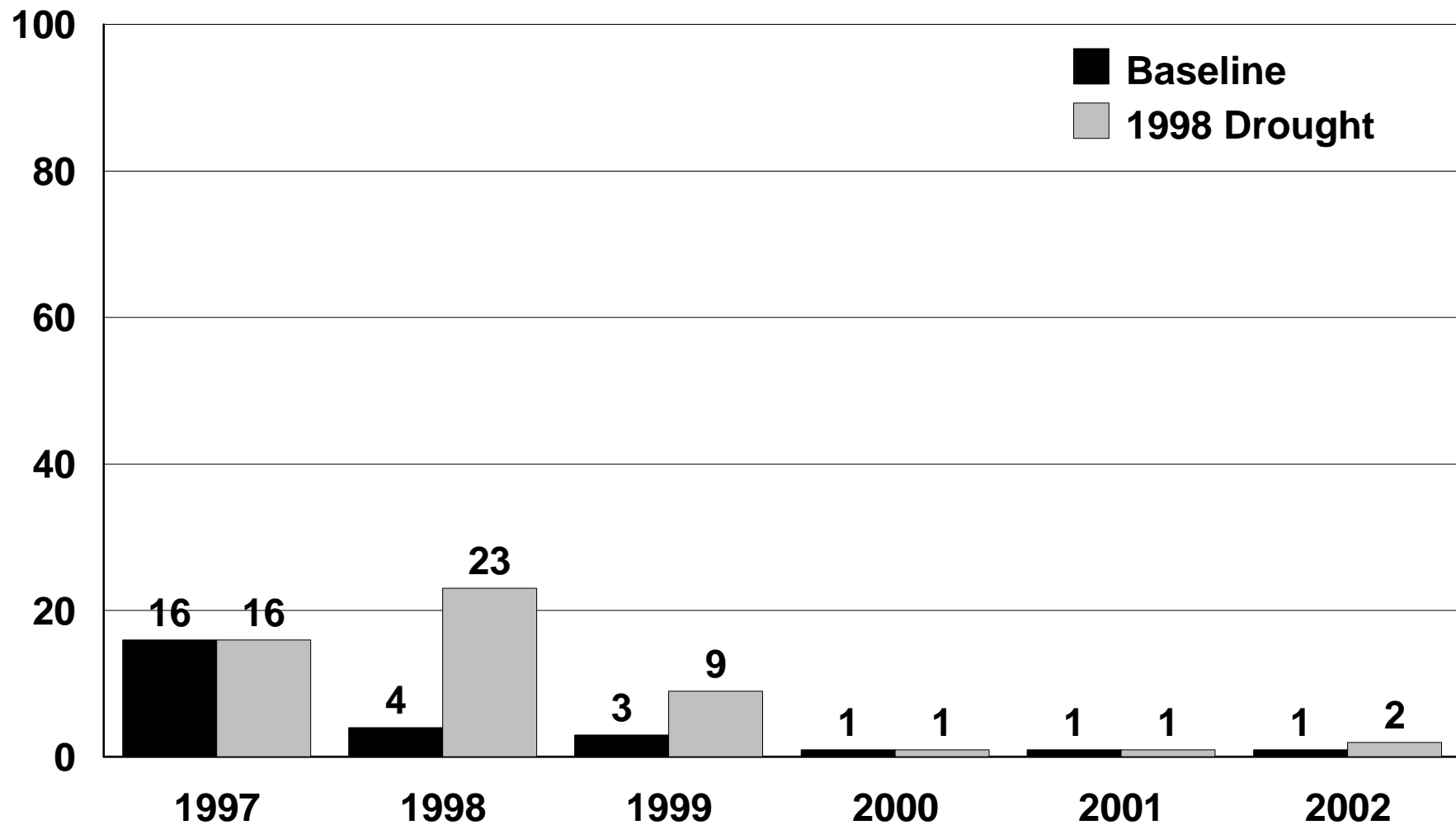
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Northern Plains Large Grain Farm

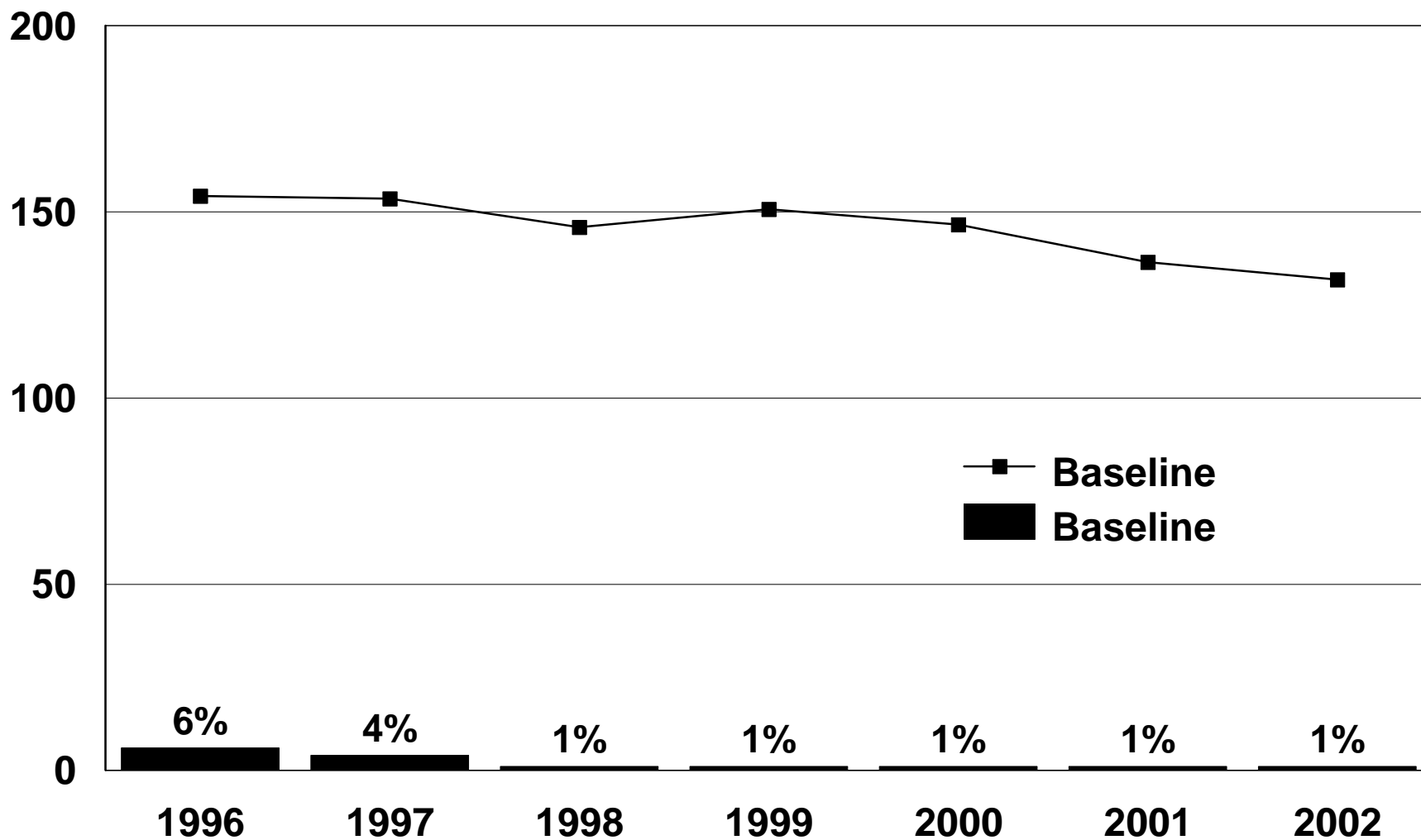
Probability of Losing Real Net Worth (%)



Texas Moderate Rice Farm

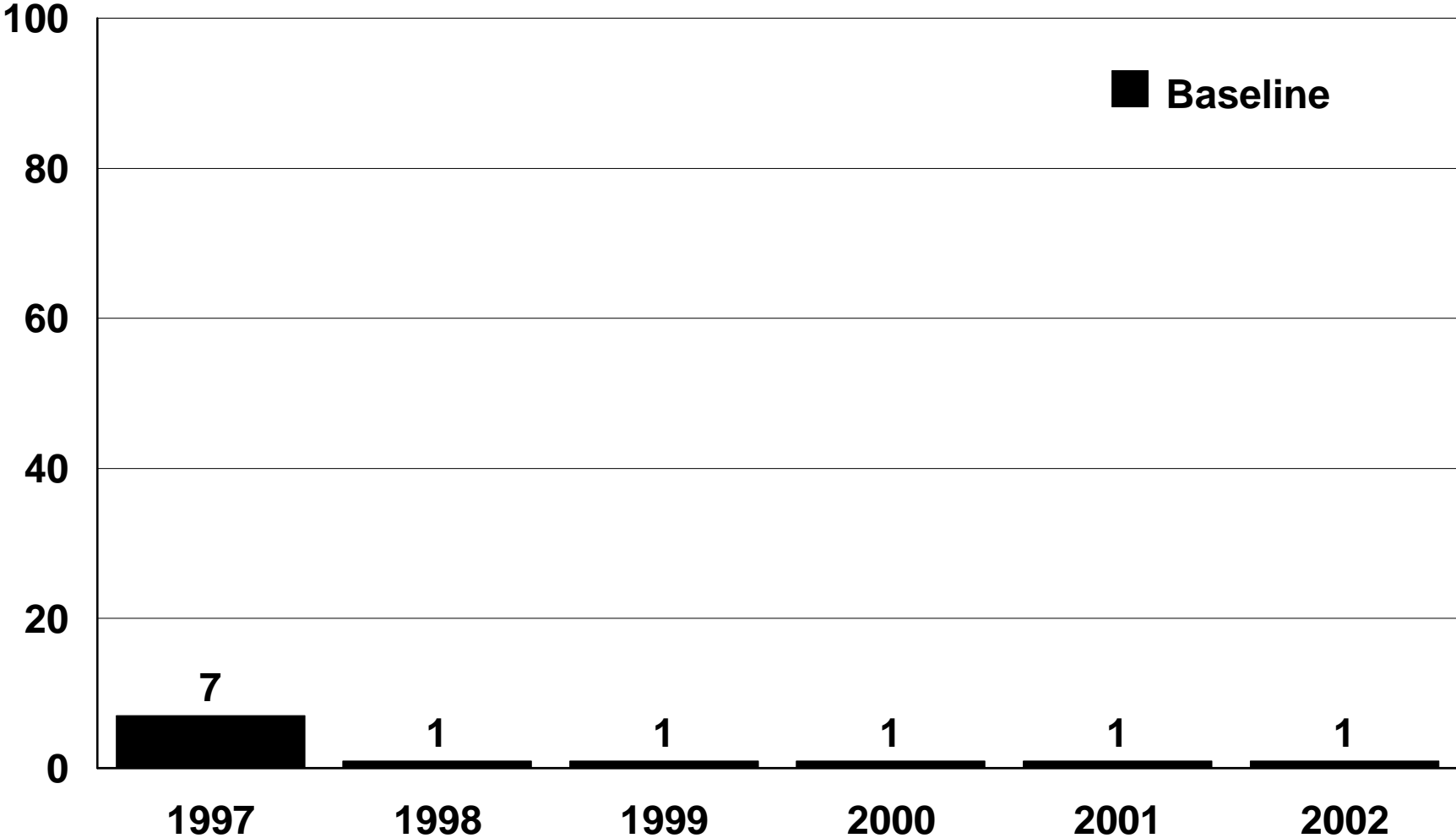
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Moderate Rice Farm

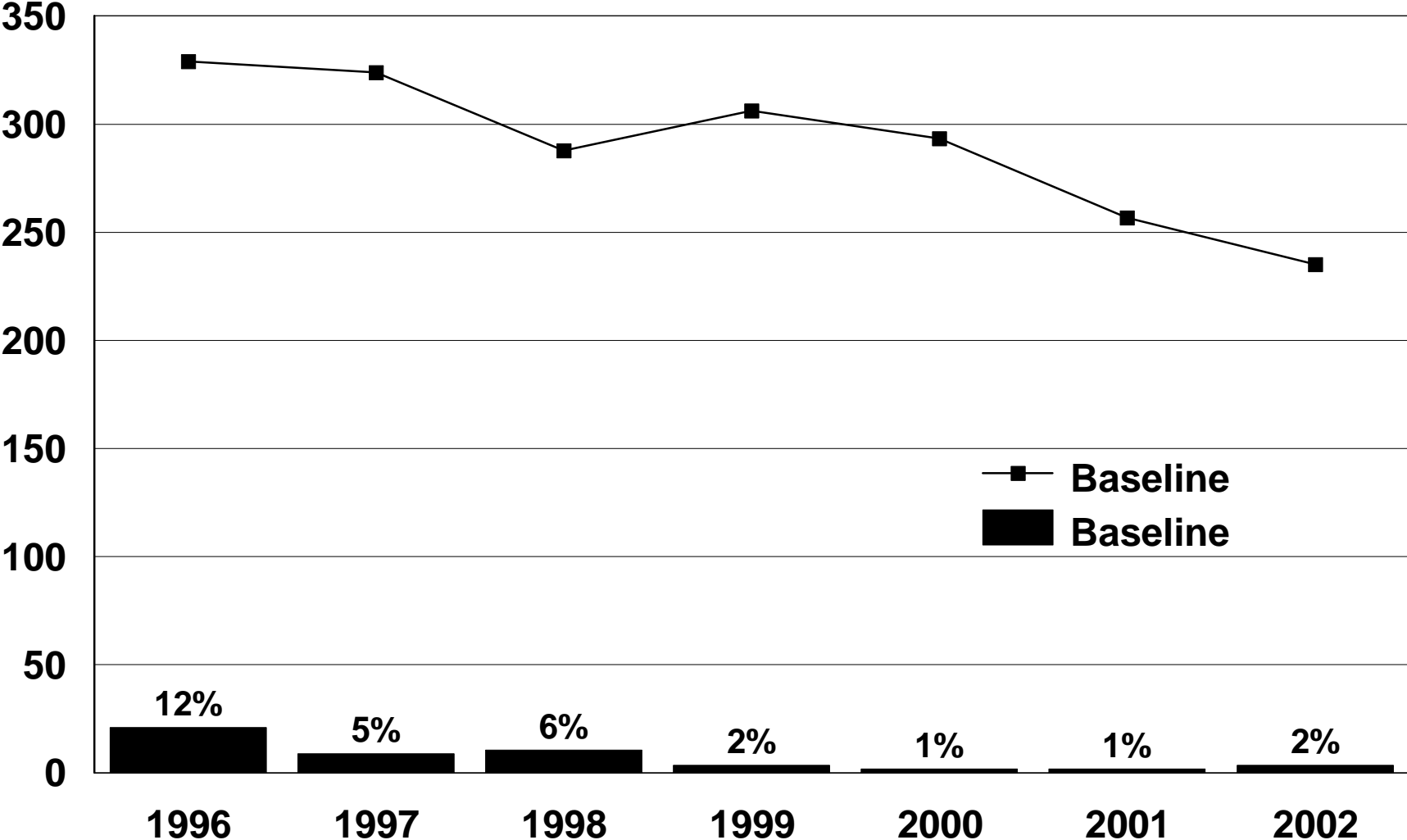
Probability of Losing Real Net Worth (%)



Texas Large Rice Farm

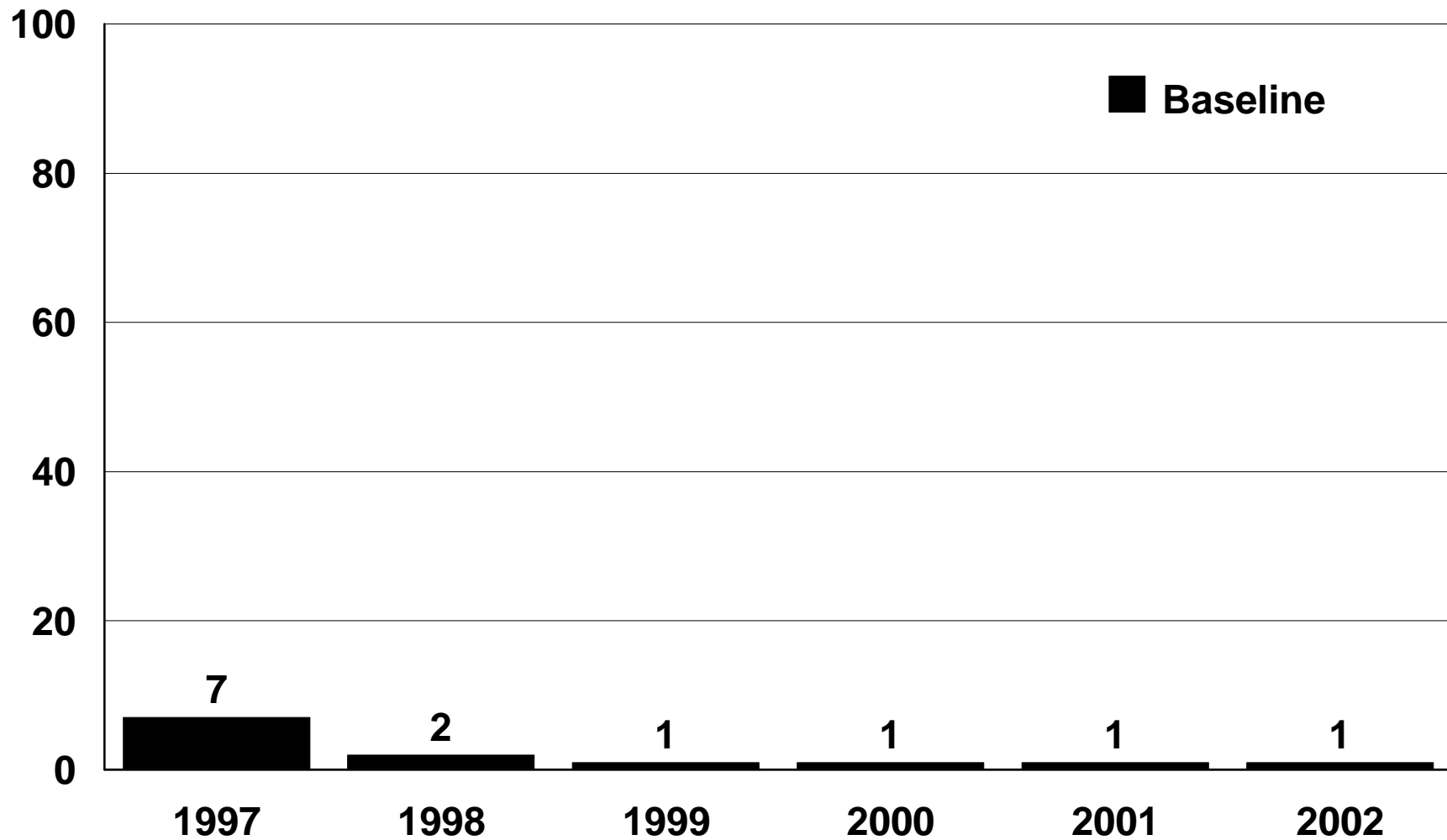
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Texas Large Rice Farm

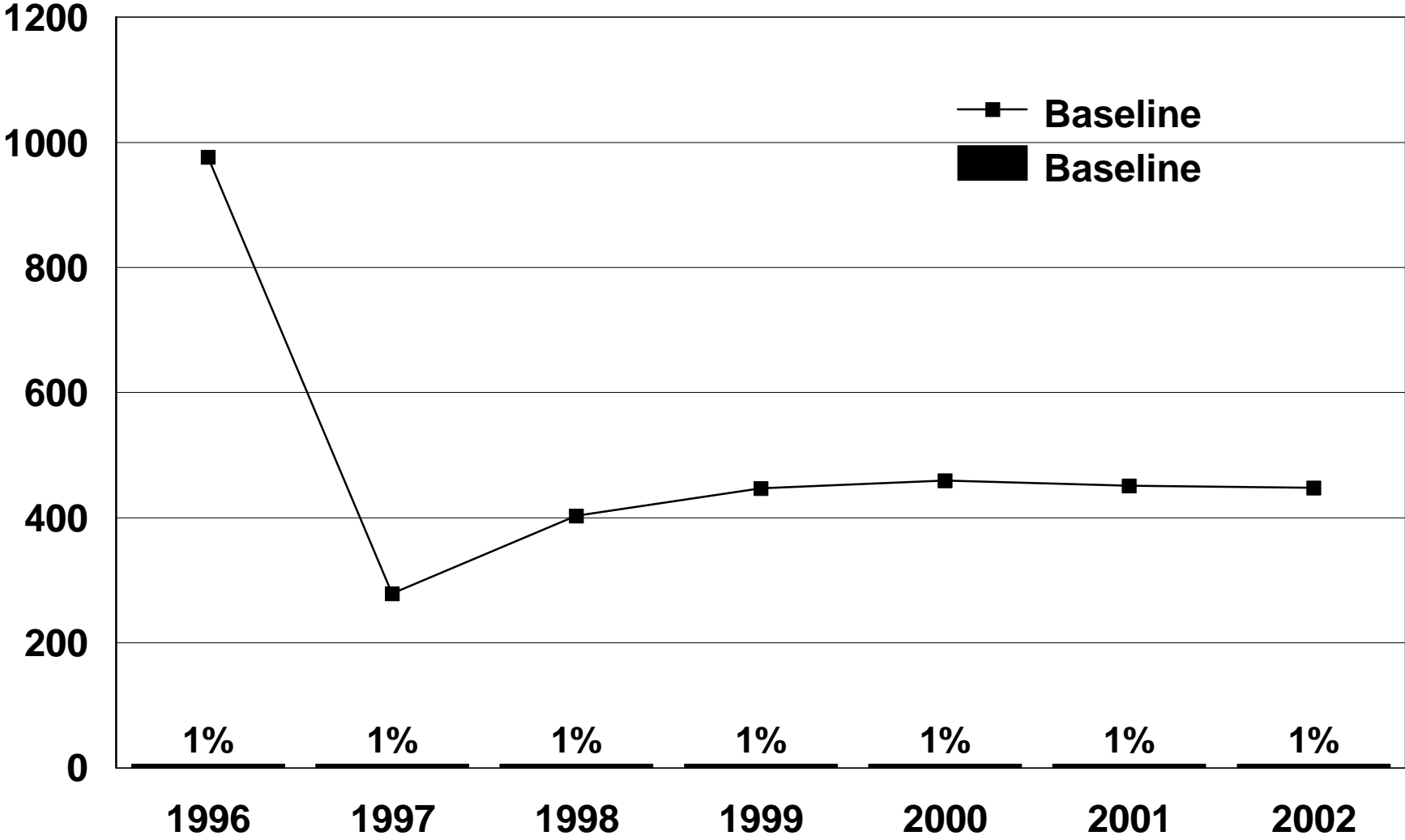
Probability of Losing Real Net Worth (%)



Central Texas Large Dairy

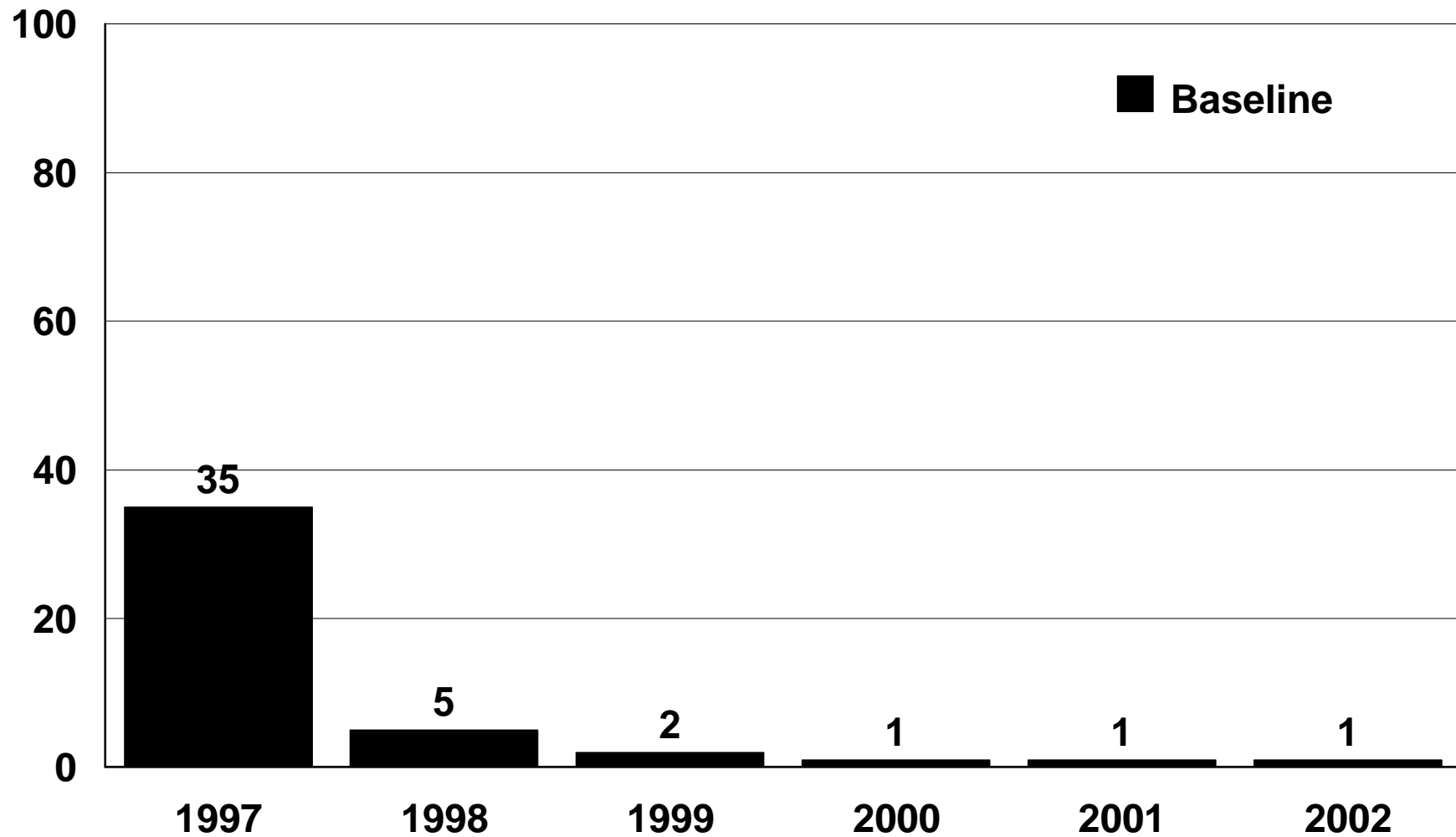
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



Central Texas Large Dairy

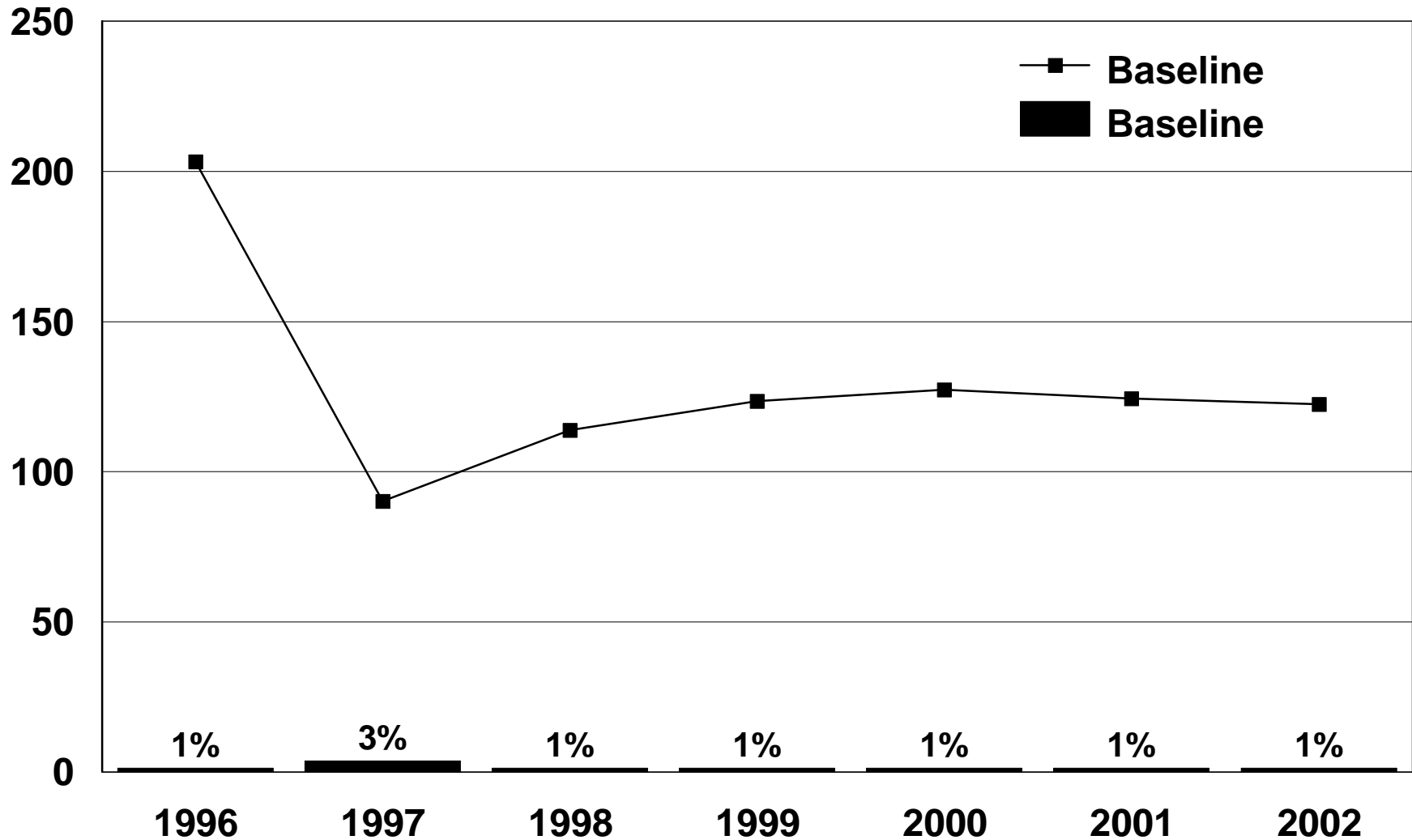
Probability of Losing Real Net Worth (%)



East Texas Moderate Dairy

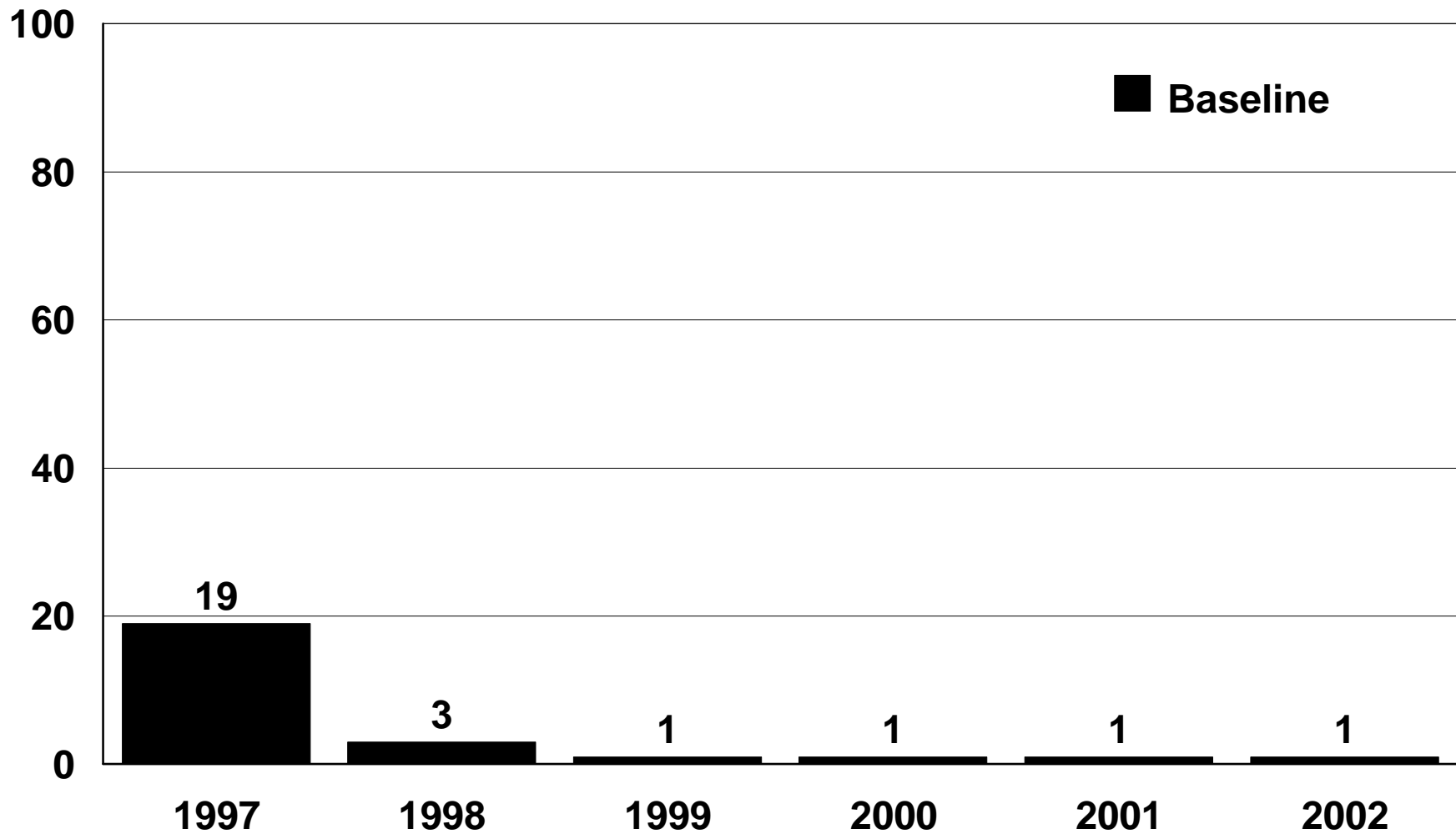
Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



East Texas Moderate Dairy

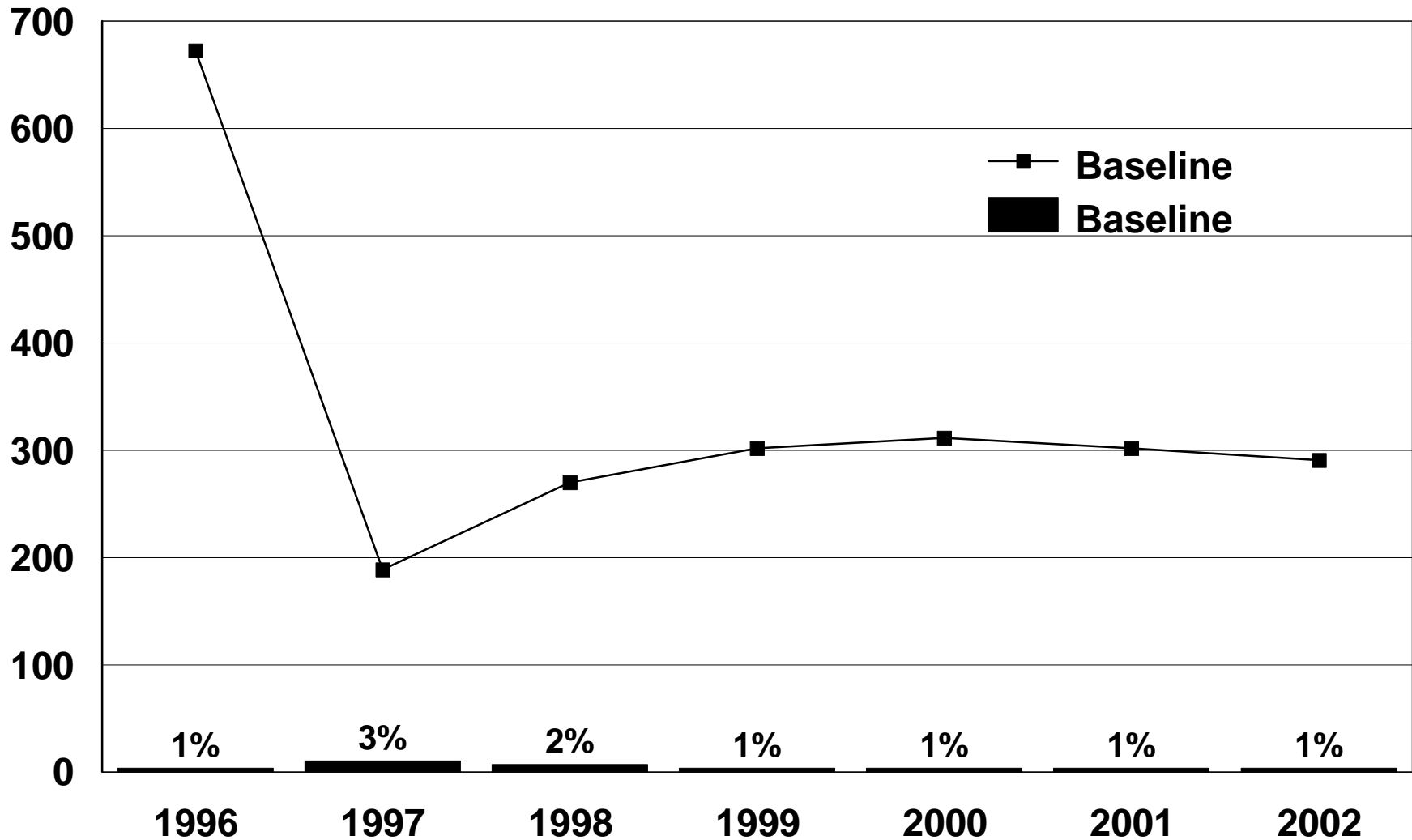
Probability of Losing Real Net Worth (%)



East Texas Large Dairy

Net Cash Farm Income (\$1,000)

Probability of Refinancing Deficits (%)



East Texas Large Dairy

Probability of Losing Real Net Worth (%)

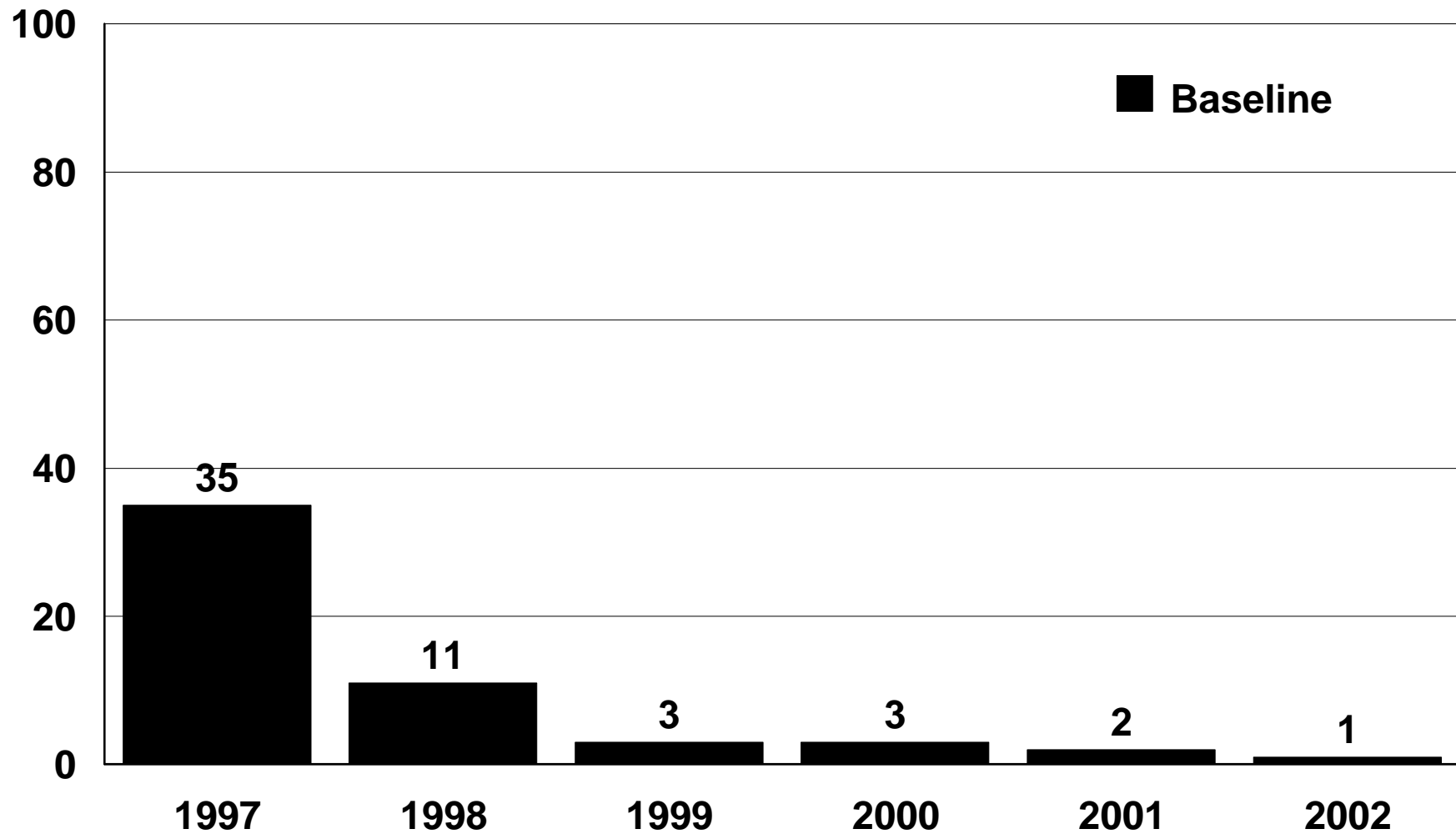


Table 1. FINANCIAL IMPACTS OF THE 1998 DROUGHT ON REPRESENTATIVE TEXAS SOUTHERN PLAINS (TXSP1682, TXSP3697) COTTON FARMS.

	TXSPI682 BASELINE	TXSPI682 98 DROUGHT	TXSP3697 BASELINE	TXSP3697 98 DROUGHT
Average Annual % Change in Real Net Worth 1997-2002	1.10	-3.56	8.15	3.44
Cost to Receipts Ratio (%)				
1996-2002 Average	86.37	100.42	80.11	88.68
Total Cash Receipts (\$1000)				
1996	162.95	162.95	720.22	720.22
1997	296.53	296.53	960.15	960.15
1998	298.29	130.81	969.72	557.64
1999	303.08	303.08	987.17	987.17
2000	301.18	301.18	984.53	984.53
2001	303.53	303.53	993.89	993.89
2002	306.75	306.75	1008.13	1008.13
1996-2002 Average	281.76	257.83	946.26	887.39
Total Govt Payments (\$1000)				
1996	18.58	18.58	51.99	51.99
1997	19.16	19.16	53.62	53.62
1998	20.35	20.35	56.95	56.95
1999	19.74	19.74	55.25	55.25
2000	18.08	18.08	50.59	50.59
2001	14.56	14.56	40.75	40.75
2002	14.11	14.11	39.50	39.50
1996-2002 Average	17.80	17.80	49.81	49.81
Net Cash Farm Income (\$1000)				
1996	-32.23	-32.23	40.31	40.31
1997	74.54	74.54	250.16	250.16
1998	75.59	-69.42	259.26	-106.88
1999	79.93	65.27	266.55	236.97
2000	75.33	60.70	257.33	228.51
2001	70.97	56.17	256.13	227.96
2002	71.50	55.64	262.31	233.13
1996-2002 Average	59.38	30.10	227.43	158.59
Prob. of a Cash Flow Deficit (%)				
1996	99.00	99.00	69.00	69.00
1997	80.00	80.00	36.00	36.00
1998	70.00	99.00	41.00	99.00
1999	71.00	98.00	53.00	68.00
2000	70.00	92.00	49.00	65.00
2001	73.00	92.00	50.00	69.00
2002	74.00	91.00	43.00	61.00
Ending Cash Reserves (1,000)				
1996	-78.18	-78.18	-80.03	-80.03
1997	-65.77	-65.77	38.20	38.20
1998	-55.63	-194.60	107.26	-220.69
1999	-49.48	-188.14	154.74	-151.94
2000	-40.81	-187.97	203.76	114.39
2001	-40.83	-199.01	236.91	-98.25
2002	-39.07	-207.74	288.25	-63.85
1996-2002 / Average	-52.82	-160.20	135.59	-98.71
Prob. of Refinancing Deficits (%)				
1996	99.00	99.00	69.00	69.00
1997	80.00	80.00	34.00	34.00
1998	67.00	99.00	32.00	80.00
1999	59.00	98.00	26.00	66.00
2000	62.00	92.00	26.00	57.00
2001	63.00	90.00	24.00	61.00
2002	61.00	88.00	23.00	51.00
Prob. of Losing Real Net Worth (%)				
1996	1.00	1.00	1.00	1.00
1997	29.00	29.00	16.00	16.00
1998	23.00	84.00	16.00	60.00
1999	19.00	64.00	12.00	43.00
2000	18.00	57.00	9.00	32.00
2001	18.00	57.00	8.00	29.00
2002	20.00	54.00	3.00	20.00

Table 2. FINANCIAL IMPACTS OF THE 1998 DROUGHT ON REPRESENTATIVE TEXAS ROLLING PLAINS (TXRP2065), BLACKLAND(TXBL1200), AND COASTAL BEND(TXCB1700) COTTON FARMS.

	TXRP2065 BASELINE	TXRP2065 98 DROUGHT	TXBL1200 BASELINE	TXBL1200 98 DROUGHT	TXCB1700 BASELINE	TXCB1700 98 DROUGHT
Average Annual % Change in Real Net Worth 1997-2002	0.53	-3.15	-5.29	-7.75	-6.54	-10.54
Cost to Receipts Ratio (%)						
1996-2002 Average	89.13	97.69	98.56	109.48	103.33	113.38
Total Cash Receipts (\$1000)						
1996	209.45	209.45	139.40	139.40	259.37	259.37
1997	229.81	229.81	188.36	188.36	421.57	421.57
1998	238.11	135.86	192.10	112.55	440.53	232.83
1999	238.42	238.42	268.25	268.25	438.06	438.06
2000	243.33	243.33	273.84	273.84	441.41	441.41
2001	242.93	242.93	275.04	275.04	443.79	443.79
2002	244.90	244.90	271.27	271.27	447.45	447.45
1996-2002 Average	235.28	220.67	229.75	218.39	413.17	383.50
Total Govt Payments (\$1000)						
1996	25.05	25.05	17.28	17.28	34.38	34.38
1997	26.57	26.57	18.24	18.24	35.25	35.25
1998	28.36	28.29	21.83	21.18	42.07	40.81
1999	27.47	27.47	22.78	22.78	41.02	41.02
2000	25.09	25.09	20.40	20.40	37.14	37.14
2001	20.21	20.21	16.48	16.48	29.92	29.92
2002	19.59	19.59	15.97	15.97	28.96	28.96
1996-2002 Average	24.62	24.61	19.00	18.90	35.53	35.35
Net Cash Farm Income (\$1000)						
1996	37.90	37.90	-48.83	-48.83	-63.72	-63.72
1997	50.95	50.95	14.36	14.36	30.35	30.35
1998	56.72	-29.36	12.70	-62.33	45.73	-99.14
1999	52.75	46.24	37.23	29.18	35.39	21.52
2000	54.95	48.47	38.51	29.91	31.33	16.71
2001	52.10	45.54	34.22	25.26	23.76	8.63
2002	43.95	37.06	33.45	23.81	17.63	1.45
1996-2002 Average	49.90	33.83	17.38	1.62	17.21	-12.03
Prob. of a Cash Flow Deficit (%)						
1996	49.00	49.00	99.00	99.00	99.00	99.00
1997	57.00	57.00	99.00	99.00	86.00	86.00
1998	62.00	98.00	99.00	99.00	80.00	99.00
1999	66.00	84.00	94.00	99.00	84.00	95.00
2000	64.00	78.00	94.00	98.00	86.00	94.00
2001	67.00	76.00	96.00	99.00	89.00	98.00
2002	72.00	78.00	94.00	99.00	91.00	99.00
Ending Cash Reserves (1,000)						
1996	-7.61	-7.61	-82.43	-82.43	-102.49	-102.49
1997	-5.58	-5.58	-103.25	-103.25	-110.04	-110.04
1998	-3.27	-79.70	-127.50	-201.98	-115.72	-254.13
1999	-18.41	-94.28	-138.57	-219.74	-136.59	-277.36
2000	-16.28	-96.00	-154.18	-242.33	-164.88	-316.03
2001	-20.25	-104.58	-178.72	-273.45	-206.59	-367.86
2002	-38.34	-128.63	-195.80	-298.31	-247.02	-421.50
1996-2002 Average	-15.68	-73.77	-140.06	-203.07	-154.76	-264.20
Prob. of Refinancing Deficit (%)						
1996	49.00	49.00	99.00	99.00	99.00	99.00
1997	47.00	47.00	99.00	99.00	86.00	86.00
1998	50.00	81.00	99.00	99.00	79.00	98.00
1999	48.00	80.00	94.00	99.00	78.00	95.00
2000	48.00	71.00	92.00	98.00	80.00	94.00
2001	54.00	69.00	94.00	99.00	81.00	97.00
2002	55.00	70.00	92.00	98.00	86.00	98.00
Prob. of Losing Real Net Worth (%)						
1996	1.00	1.00	1.00	1.00	1.00	1.00
1997	36.00	36.00	60.00	60.00	51.00	51.00
1998	36.00	74.00	67.00	99.00	49.00	92.00
1999	34.00	61.00	70.00	93.00	49.00	87.00
2000	35.00	57.00	72.00	92.00	53.00	85.00
2001	34.00	57.00	69.00	93.00	58.00	82.00
2002	42.00	60.00	80.00	92.00	62.00	87.00

Table 3. FINANCIAL IMPACTS OF THE 1998 DROUGHT ON REPRESENTATIVE TEXAS NORTHERN HIGH PLAINS(TXNP1600), (TXNP5500) GRAIN FARMS.

	TXNP1600 BASELINE	TXNP1600 98 DROUGHT	TXNP5500 BASELINE	TXNP5500 98 DROUGHT
Average Annual % Change in Real Net Worth 1997-2002	8.00	6.65	11.22	10.14
Cost to Receipts Ratio (%) 1996-2002 Average	70.12	73.23	65.23	68.08
Total Cash Receipts (\$1000)				
1996	393.03	393.03	1476.10	1476.10
1997	348.17	348.17	1312.15	1312.15
1998	348.09	288.08	1299.31	1058.43
1999	345.43	345.43	1298.05	1298.05
2000	355.14	355.14	1329.64	1329.64
2001	355.73	355.73	1339.79	1339.79
2002	362.13	362.13	1363.91	1363.91
1996-2002 Average	358.25	349.67	1345.57	1311.15
Total Govt Payments (\$1000)				
1996	27.74	27.74	84.85	84.85
1997	32.20	32.20	102.87	102.87
1998	40.40	39.14	130.78	125.51
1999	39.37	39.37	128.00	128.00
2000	35.42	35.42	115.29	115.29
2001	29.15	29.15	96.04	96.04
2002	27.85	27.85	90.87	90.87
1996-2002 Average	33.16	32.98	106.96	106.21
Net Cash Farm Income (\$1000)				
1996	137.96	137.96	592.93	592.93
1997	107.68	107.68	462.69	462.69
1998	109.54	40.91	464.20	196.53
1999	108.33	103.99	471.05	459.76
2000	115.04	111.44	496.18	487.33
2001	113.95	110.80	503.87	497.56
2002	115.99	113.02	515.64	511.27
1996-2002 Average	115.50	103.68	500.94	458.30
Prob. of a Cash Flow Deficit (%)				
1996	6.00	6.00	9.00	9.00
1997	24.00	24.00	27.00	27.00
1998	30.00	69.00	30.00	72.00
1999	25.00	25.00	17.00	16.00
2000	33.00	38.00	16.00	23.00
2001	34.00	39.00	11.00	13.00
2002	30.00	32.00	21.00	20.00
Ending Cash Reserves (\$1000)				
1996	71.41	71.41	260.51	260.51
1997	113.45	113.45	393.21	393.21
1998	144.85	90.84	507.85	307.15
1999	176.42	127.91	671.44	498.66
2000	209.90	159.18	846.02	672.83
2001	233.66	180.45	1044.23	862.93
2002	264.03	207.69	1230.08	1041.54
1996-2002 Average	173.39	135.85	707.62	576.69
Prob. of Refinancing Deficits (%)				
1996	6.00	6.00	9.00	9.00
1997	4.00	4.00	6.00	6.00
1998	6.00	18.00	5.00	20.00
1999	5.00	10.00	4.00	9.00
2000	4.00	9.00	1.00	6.00
2001	3.00	7.00	1.00	1.00
2002	5.00	8.00	1.00	3.00
Prob. of Losing Real Net Worth (%)				
1996	1.00	1.00	1.00	1.00
1997	24.00	24.00	16.00	16.00
1998	13.00	38.00	4.00	23.00
1999	10.00	19.00	3.00	9.00
2000	7.00	13.00	1.00	1.00
2001	4.00	10.00	1.00	1.00
2002	6.00	10.00	1.00	2.00

Table 4. FINANCIAL IMPACTS THE 1998 DROUGHT ON REPRESENTATIVE TEXAS RICE (TXR2118, TXR3750) FARMS AND CENTRAL AND EAST TEXAS(TXCD, TXED) DAIRIES

	TXR2118 BASELINE	TXR3750 BASELINE	TXCD400 BASELINE	TXCD825 BASELINE	TXED210 BASELINE	TXED650 BASELINE
Average Annual % change in Real Net Worth 1997-2002	10.48	7.44	1.15	12.08	8.49	8.60
Cost to Receipts Ratio (%) 1996-2002 Average	70.32	79.89	90.93	80.31	77.30	81.81
Total Cash Receipts (\$1000)						
1996	495.82	1409.22	1019.55	2502.06	558.44	1773.86
1997	491.32	1412.24	955.97	2342.98	526.38	1665.35
1998	477.90	1374.92	974.92	2388.55	537.66	1698.46
1999	478.63	1384.94	989.22	2421.50	546.53	1723.71
2000	472.88	1373.43	1002.85	2454.20	553.96	1747.26
2001	461.59	1341.79	1013.29	2480.61	559.39	1765.43
2002	461.28	1337.80	1023.75	2507.46	564.30	1783.37
1996-2002 Average	477.06	1376.33	997.08	2442.48	549.52	1736.78
Net Cash Farm Income (\$1000)						
1996	154.28	329.02	288.34	976.97	203.35	672.69
1997	153.54	323.55	30.97	278.76	90.14	188.62
1998	145.88	287.90	66.56	403.24	113.87	269.80
1999	150.73	306.19	78.85	447.36	123.49	301.84
2000	146.68	293.33	81.65	459.27	127.31	311.42
2001	136.56	256.77	70.56	450.99	124.48	301.84
2002	131.79	235.13	58.56	448.26	122.45	290.91
1996-2002 Average	145.64	290.31	96.50	494.98	129.30	333.87
Prob. of a Cash Flow Deficit (%)						
1996	6.00	12.00	1.00	1.00	1.00	1.00
1997	14.00	21.00	89.00	51.00	40.00	50.00
1998	12.00	24.00	54.00	10.00	22.00	29.00
1999	13.00	20.00	68.00	9.00	16.00	30.00
2000	8.00	25.00	56.00	8.00	15.00	21.00
2001	9.00	28.00	72.00	9.00	17.00	24.00
2002	9.00	35.00	76.00	10.00	17.00	22.00
Ending Cash Reserves (\$1000)						
1996	63.75	129.15	140.91	551.10	99.48	377.94
1997	119.95	256.54	69.45	582.93	109.31	379.63
1998	163.99	333.67	56.31	772.90	148.29	480.93
1999	210.31	427.60	41.44	974.88	190.60	587.12
2000	268.64	520.00	37.05	1198.57	238.52	723.41
2001	320.14	599.21	15.08	1414.35	286.42	849.82
2002	375.36	652.10	-13.41	1623.65	331.45	971.06
1996-2002 Average	217.45	416.90	49.55	1016.91	200.58	624.27
Prob. of Refinancing Deficits (%)						
1996	6.00	12.00	1.00	1.00	1.00	1.00
1997	4.00	5.00	16.00	1.00	3.00	3.00
1998	1.00	6.00	27.00	1.00	1.00	2.00
1999	1.00	2.00	35.00	1.00	1.00	1.00
2000	1.00	1.00	37.00	1.00	1.00	1.00
2001	1.00	1.00	43.00	1.00	1.00	1.00
2002	1.00	2.00	51.00	1.00	1.00	1.00
Nominal Net Worth (\$1000)						
1996	461.33	1576.26	992.09	2078.88	685.30	1953.96
1997	536.71	1814.24	977.46	2230.46	752.54	2074.95
1998	601.17	1992.42	1021.87	2537.70	830.95	2302.22
1999	672.44	2209.61	1070.31	2871.11	920.06	2552.51
2000	737.25	2371.10	1088.71	3142.09	987.80	2744.98
2001	796.62	2514.00	1090.30	3374.64	1049.80	2905.60
2002	854.94	2606.57	1065.90	3571.70	1097.45	3031.90
1996-2002 Average	665.76	2154.88	1043.81	2829.51	903.42	2509.45
Prob. of Losing Real Net Worth (%)						
1996	1.00	1.00	1.00	1.00	1.00	1.00
1997	7.00	7.00	65.00	35.00	19.00	35.00
1998	1.00	2.00	52.00	5.00	3.00	11.00
1999	1.00	1.00	56.00	2.00	1.00	3.00
2000	1.00	1.00	50.00	1.00	1.00	3.00
2001	1.00	1.00	62.00	1.00	1.00	2.00
2002	1.00	1.00	73.00	1.00	1.00	1.00

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