

Analysis of Yield and Revenue Insurance for California Vegetables

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Main Points

- Government is trying to find “insurance programs” for fresh vegetables
- Existing programs are unlikely to indemnify growers

Recent Developments in U.S. Crop Insurance

- Late 1999--RMA pursuing development of pilot program for California fresh vegetables: broccoli, cauliflower, celery, and lettuce

Recent Developments in U.S. Crop Insurance

- Agricultural Risk Protection Act 2000
 - Additional \$8.2 billion for crop insurance over 5 years
 - Changes existing programs
 - Encourages expansion into “under-served” areas and crops

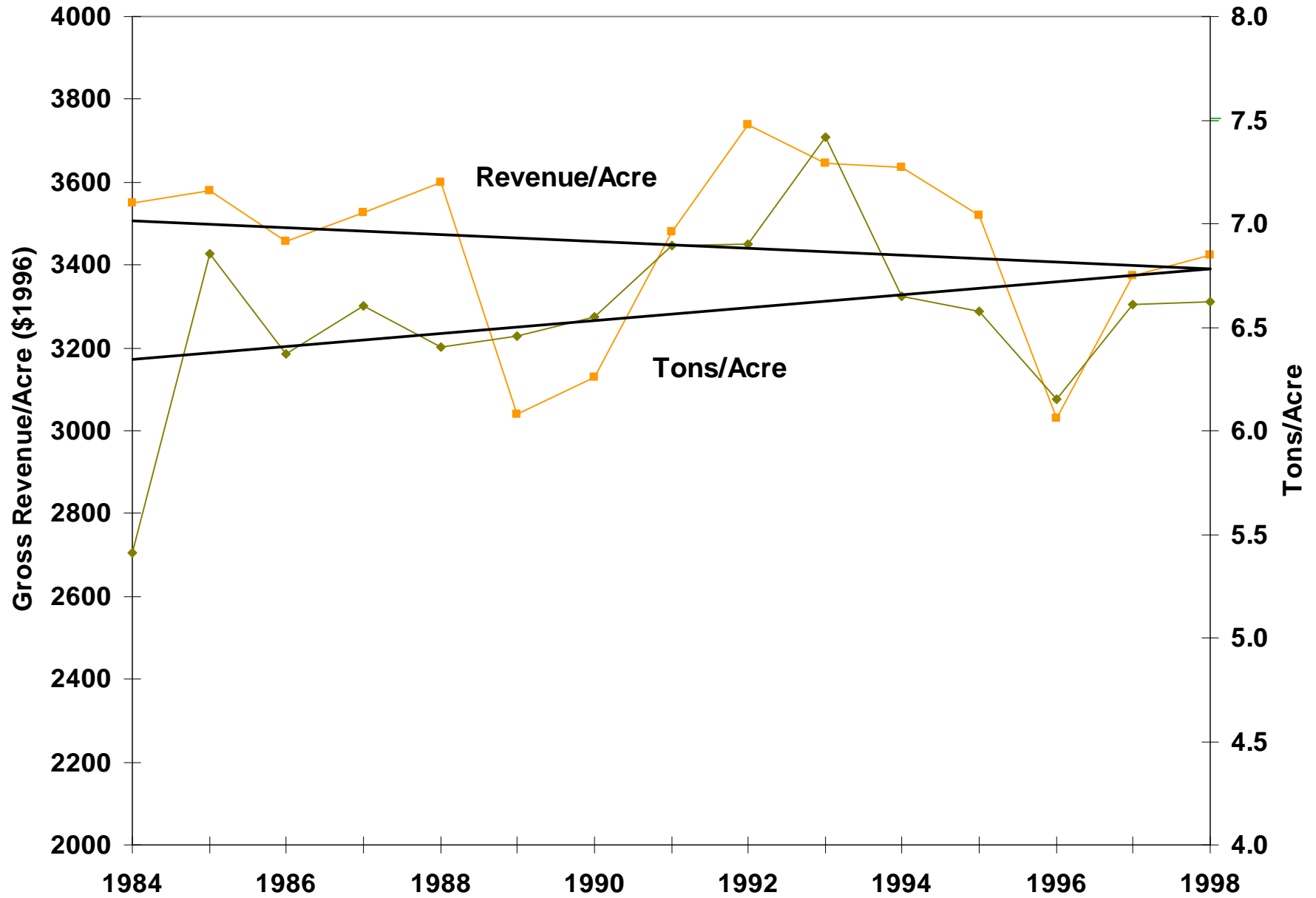
Case Study-California Broccoli

- Revenue from broccoli accounts for about 25% of broccoli grower income (USDA, 1994)
- Broccoli growers are diversified across vegetable crops
 - Most grow 5 or 6 different vegetables
 - Some grow 15 to 20 different vegetables
 - The most common complements to broccoli are lettuce, celery, and cauliflower

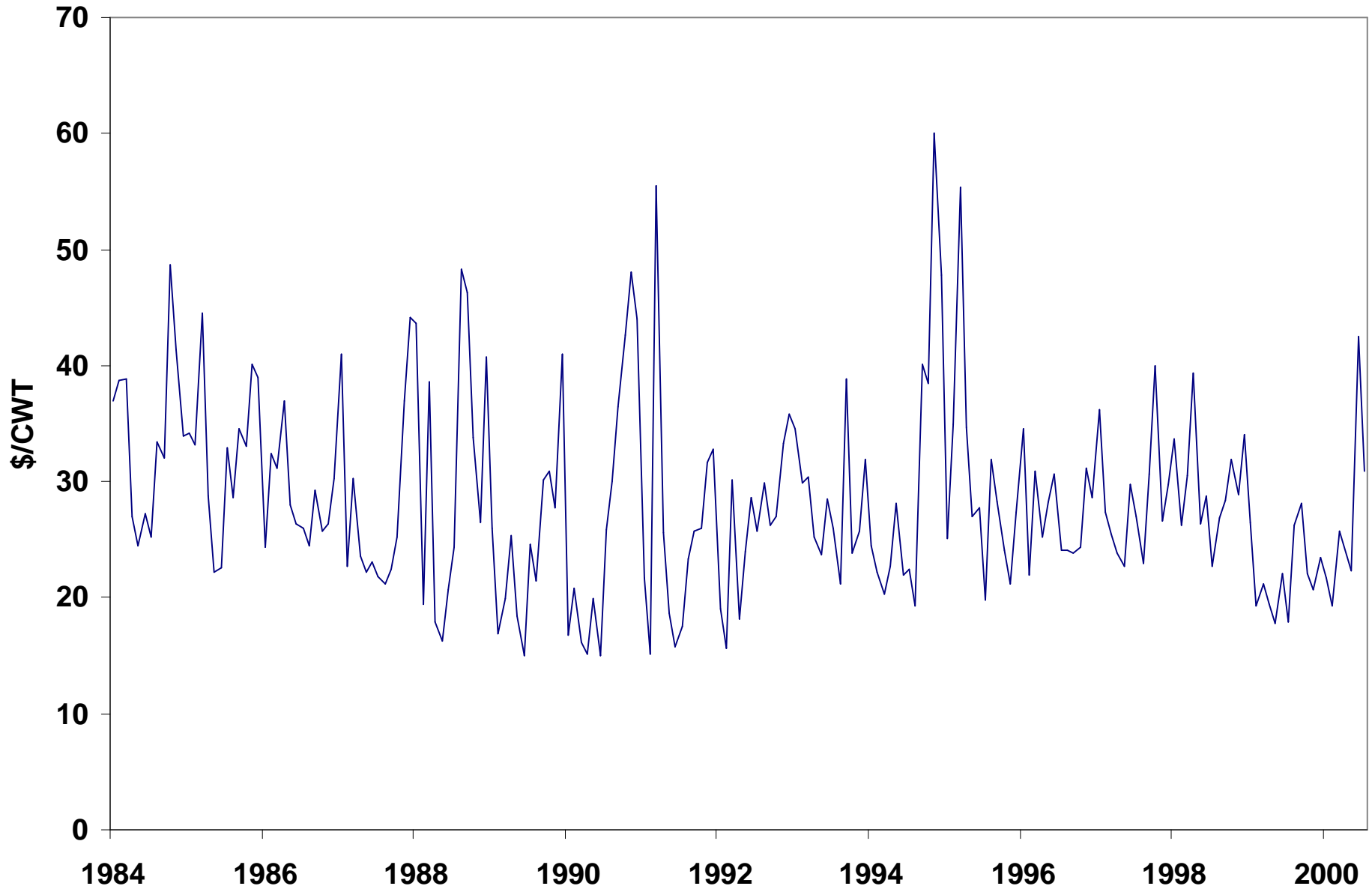
Industry Observers Note:

- Mid 1990's saw wide-scale adoption of drip irrigation and transplanting.
- Results:
 - More harvests
 - Consistently higher yields
 - Lower prices
 - Less price variability

California Broccoli Average Yield and Gross Revenue per Acre, 1984-1998



California Broccoli F.O.B. Prices, Monthly Average 1984-2000 (\$ 1996)



Structural Change in the Industry

Monthly Price (\$/cwt)	1984-1995	1996-2000
Mean	28.96	26.94
Percent Variation	31%	20%

Analysis--Important Caveats

- Used county level data for lack of individual grower data.
- Small sample--14 years

Current Insurance Tools for Vegetable Crops

- Non-insured Assistance Program (NAP)
 - Technically not insurance--no premiums
 - Disaster Insurance for Yields
 - Applies Nationally
 - Area Trigger--65%
 - Individual Trigger--50%
 - Indemnity at 60% of USDA set price

Current Insurance Tools for Vegetable Crops

- Non-insured Assistance Program (NAP)
 - ~~Technically not insurance--no premiums~~
(\$100 per crop, per county fee--ARPA)
 - Disaster Insurance for Yields
 - Applies Nationally
 - ~~Area Trigger--65%~~ (eliminated by ARPA)
 - Individual Trigger--50%
 - Indemnity at 60% of USDA set price

Policy Analysis--NAP

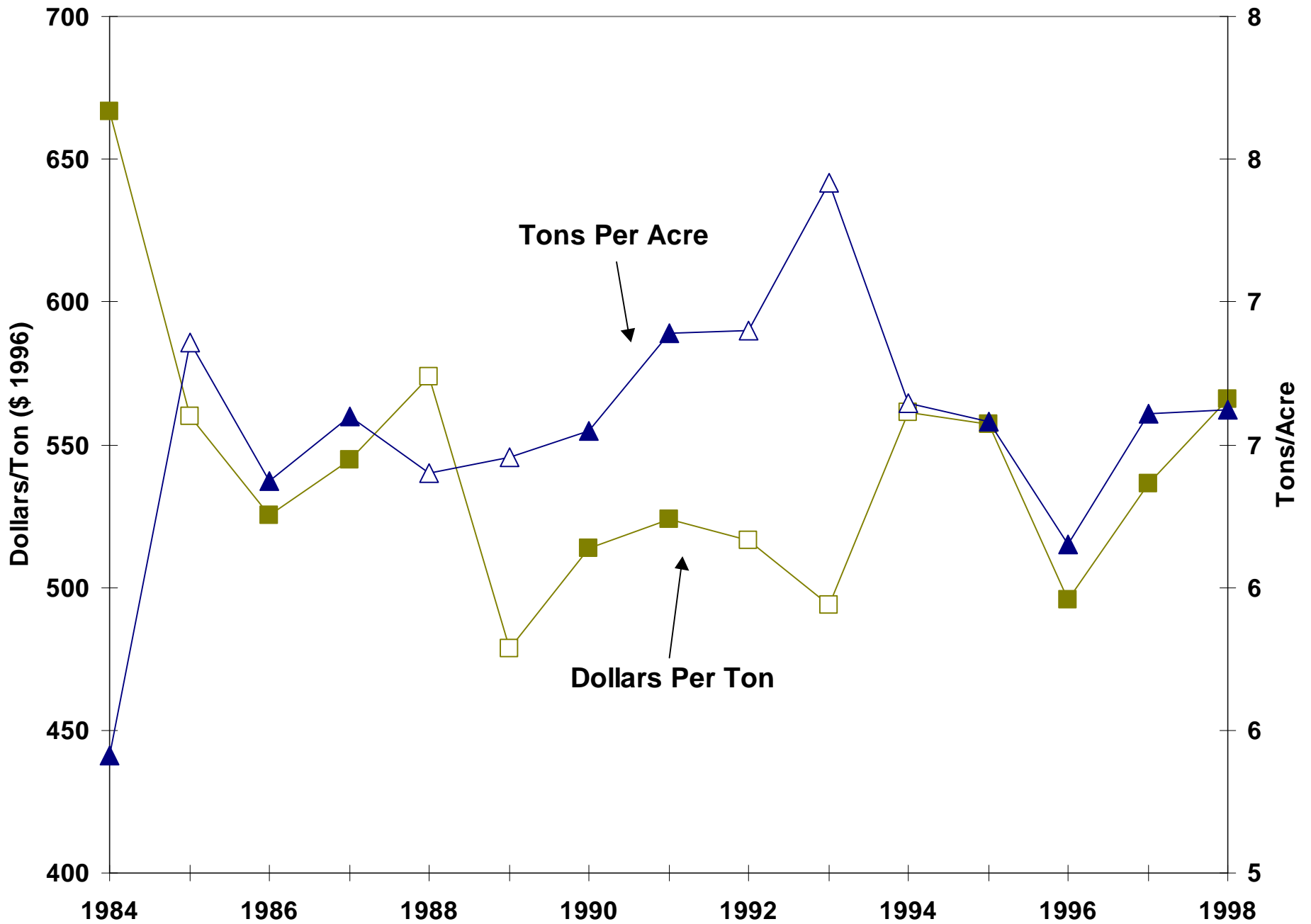
- Beta distribution of yields, 1984-1998, for Monterey, Santa Barbara, San Luis Obispo, and Imperial.
- Found a low probability of yield trigger being met.

Beta Distribution--NAP

Probability of Yield Trigger Being Met for Broccoli, 1999

% of Mean	Imperial	Monterey	San Luis Obispo	Santa Barbara
NAP 65	0.003	0.00062	0.00491	0.00001
75	0.124	0.008	0.026	0.000
85	0.195	0.062	0.099	0.011
95	0.287	0.271	0.288	0.155
100	0.341	0.463	0.442	0.427

Is There a Natural Hedge for Broccoli in California?



Is there a Natural Hedge?

- Yes--After detrending there was significant negative correlation between yield and price (good evidence for natural hedge)
- So, yield insurance may not make sense anyway

Current Pilot Programs for Vegetable Crops

- Adjusted Gross Revenue (AGR)
 - Whole farm gross revenue insurance
 - Pilot program for selected counties across U.S.
 - Not currently applicable in California
 - 5-Year average of gross revenue reported to IRS
 - Coverage levels differ by number of crops
 - 75% payment rate

Policy Analysis--Monterey AGR

- Beta distribution of per acre revenue 1986-1998
- Three tiers of diversification: 5 vegetables, 8 vegetables, all vegetables
- 25% of total acreage in broccoli

Beta Distributions--AGR Monterey

Probability of AGR Trigger Being Met for Broccoli, 1999
(25% of acres in broccoli)

Trigger	5 vegetables	8 vegetables	all vegetables
0.75	0.012	0.002	0.002
0.8	0.035	0.006	0.008
0.85	0.090	0.018	0.028
0.9	0.326	0.049	0.083
0.95	0.565	0.123	0.209

AGR Summary

- Roughly 1 out of 100 acres will fall below the existing revenue trigger
- Diversification across vegetables decreased probability of indemnification

NAP & AGR Complications

- Little incentive for the “average” farmer to enroll
- Farmers who do enroll:
 - Will be those most likely to fall below the trigger
 - Will have an incentive to grow riskier crops or to undertake riskier practices

Vegetable Insurance Summary

- Structural change has reduced variability in yields and revenues
- Existing yield and revenue triggers would have low expected payouts

Vegetable Insurance Summary

- How do you design an insurance program to indemnify growers with low variability?
 - We don't know
- * A more comprehensive analysis might use individual farm data, and a larger sample size