

# Arizona Agricultural Land and Water Use: 1945-2020

**Spring AG Outlook Forum**  
*Arizona Chapter*  
*American Society of*  
*Farm Managers and*  
*Rural Appraisers*

**Tauhidur Rahman**  
**& George Frisvold**  
*Department of Agricultural*  
*& Resource Economics*  
*University of Arizona*

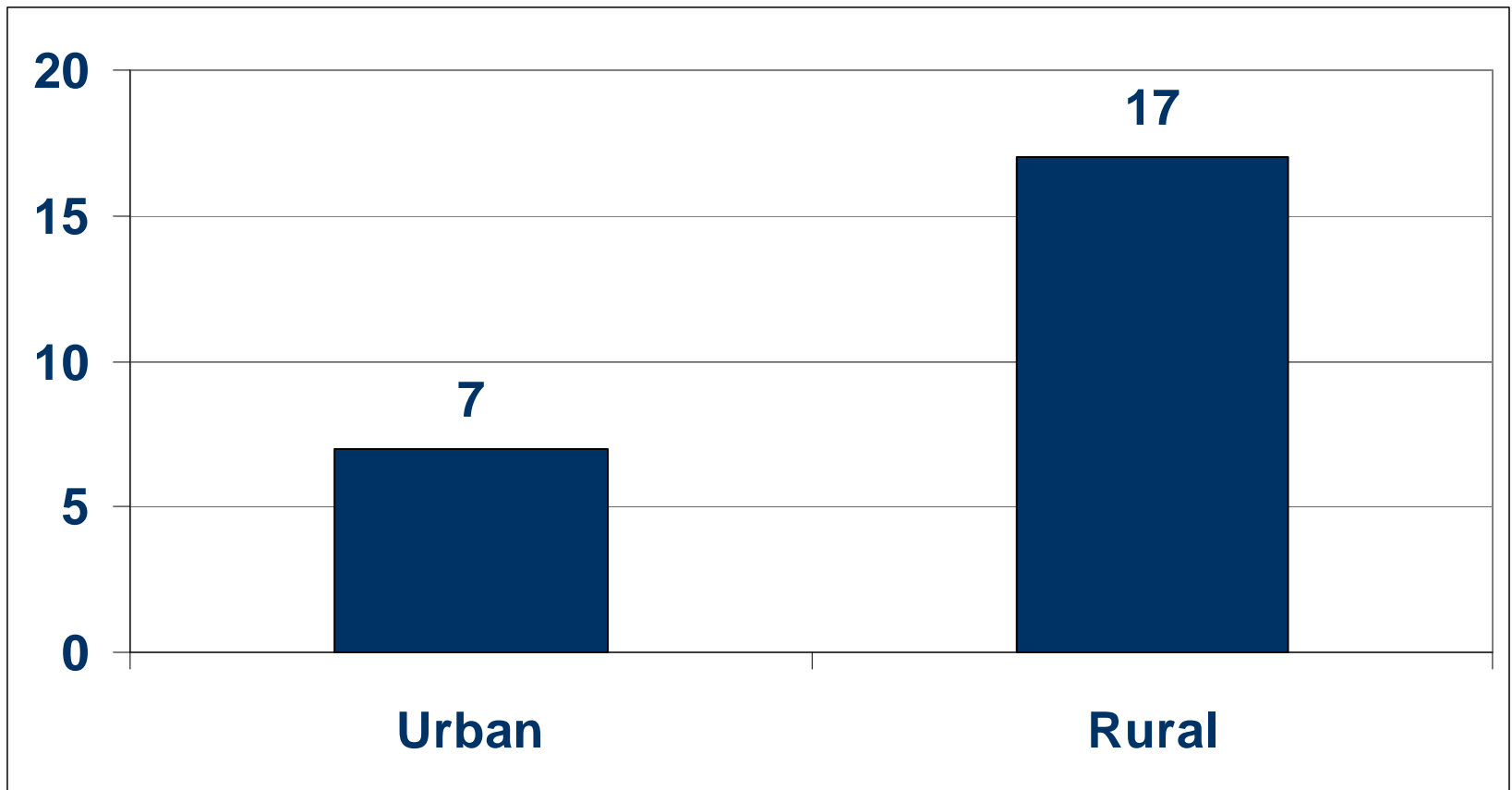


# National Picture

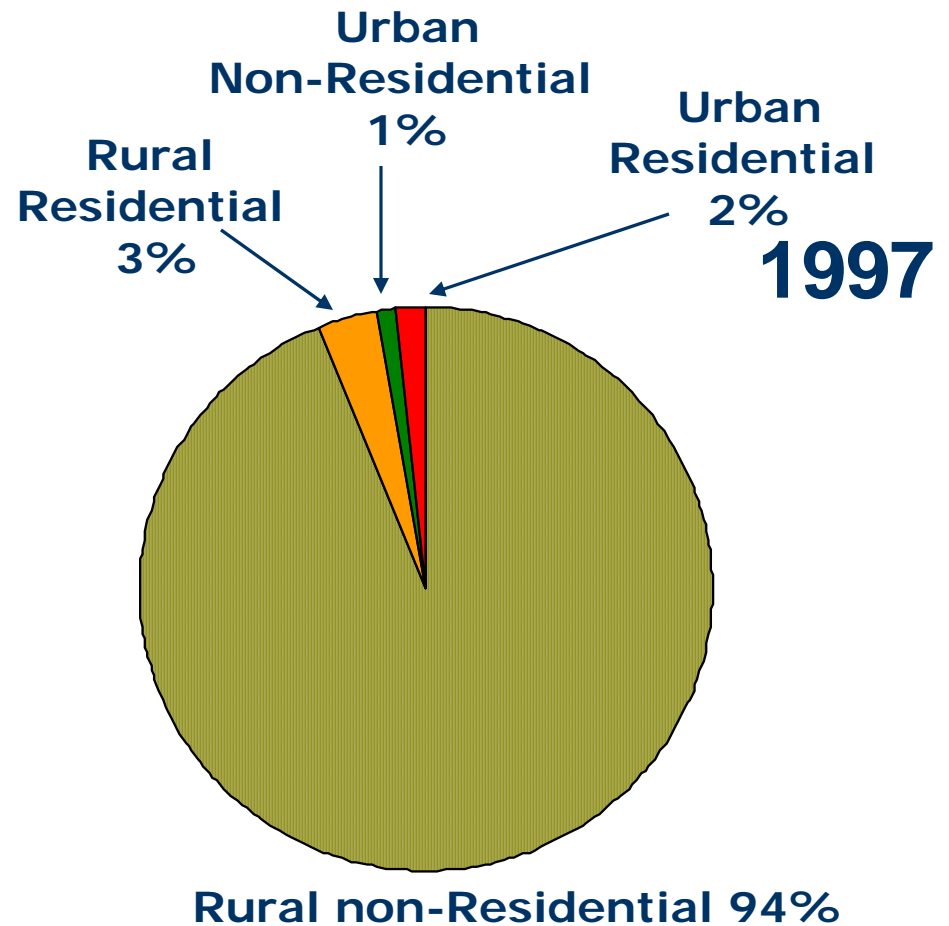
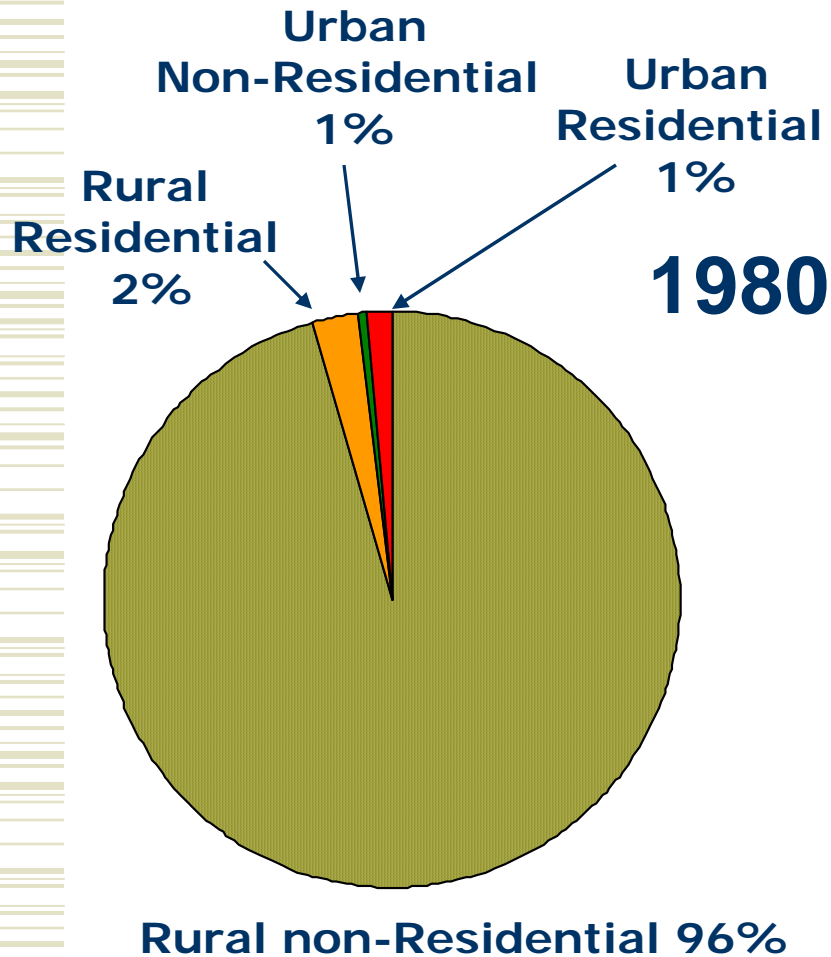


# Residential Land Use Growing Faster in Rural Areas

Growth in residential land use 1980-97 (million acres)

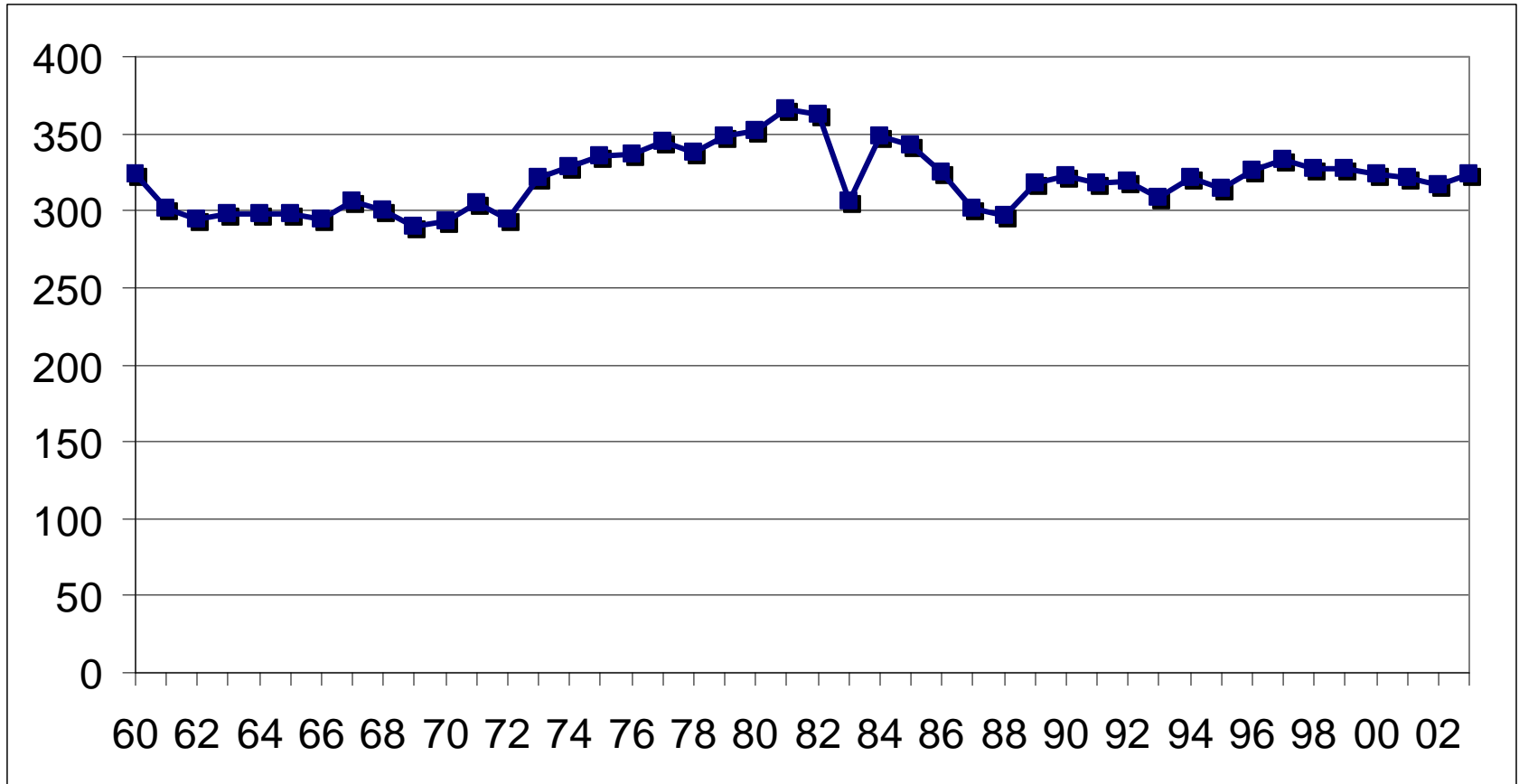


# Residential Land Still a Small Share of Total US Land Use

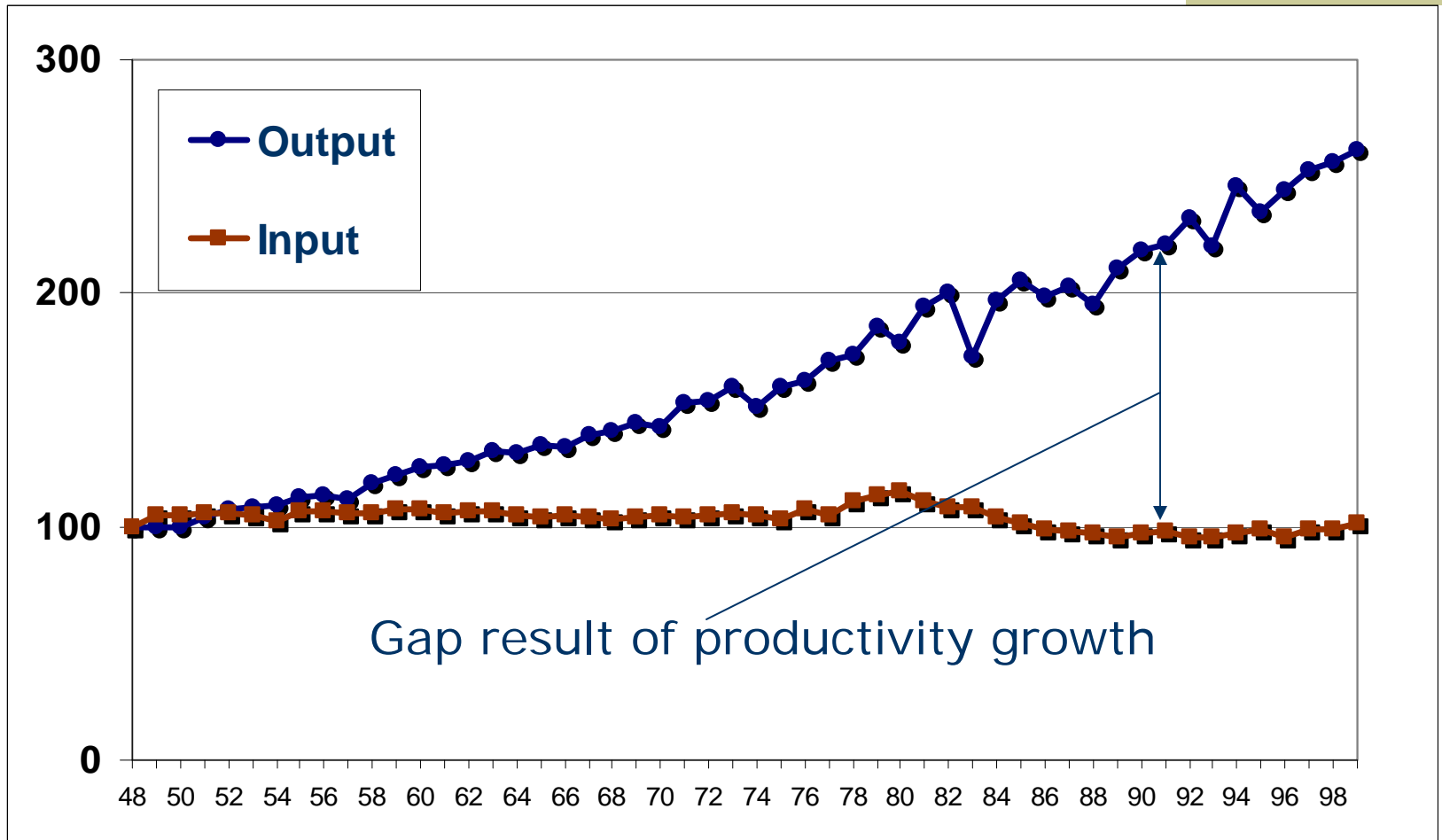


# More Cropland Harvested Now in US than in 1960s

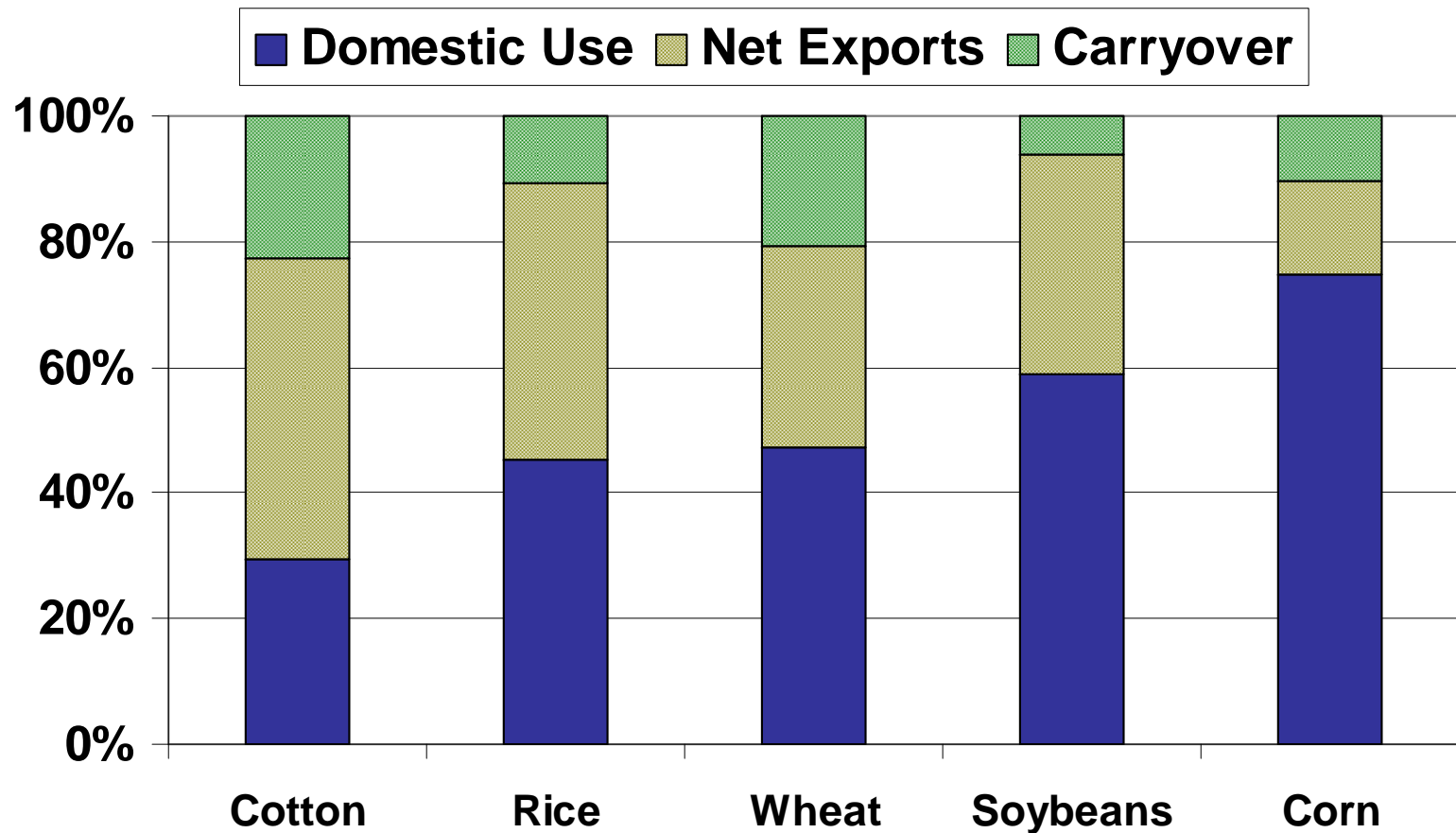
Million acres



# From 1948-99 Ag Output Grew 260%, With Total Inputs Constant



# US Crop Production Far Exceeds Domestic Consumption

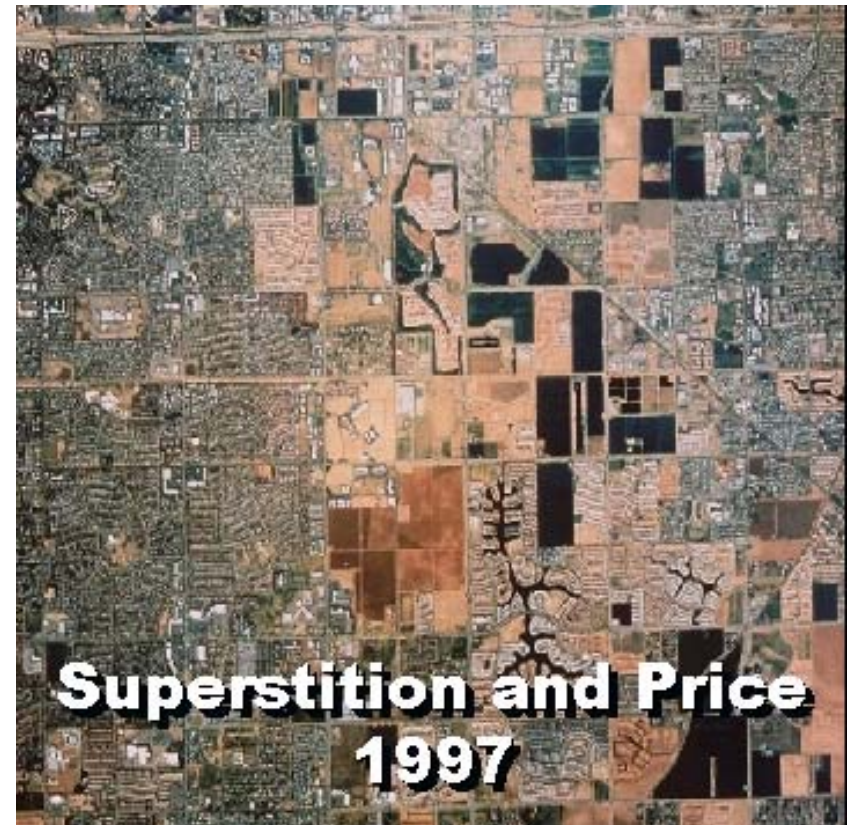
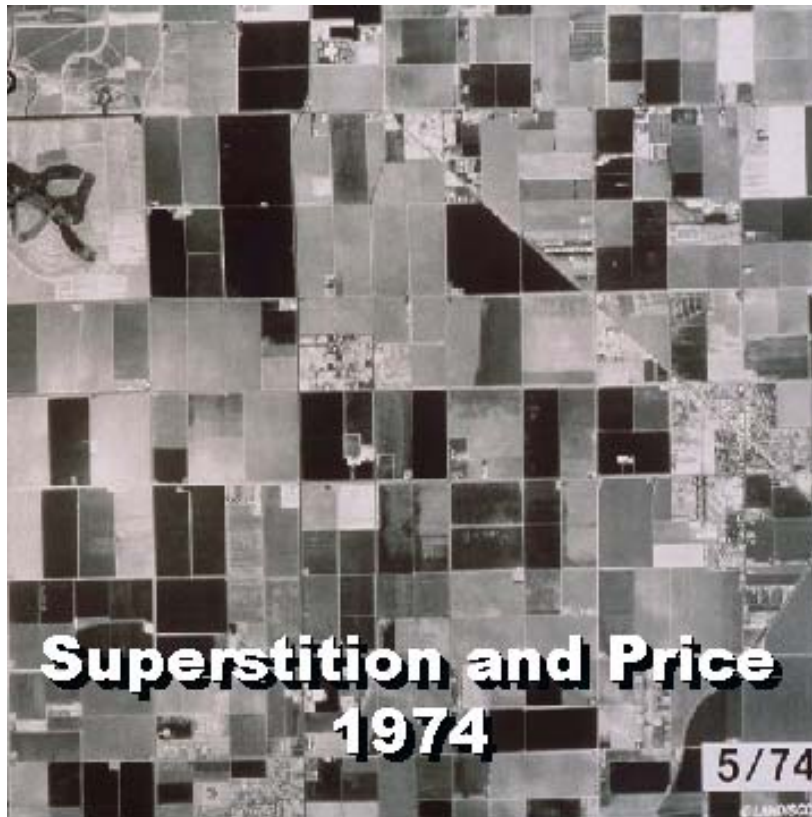




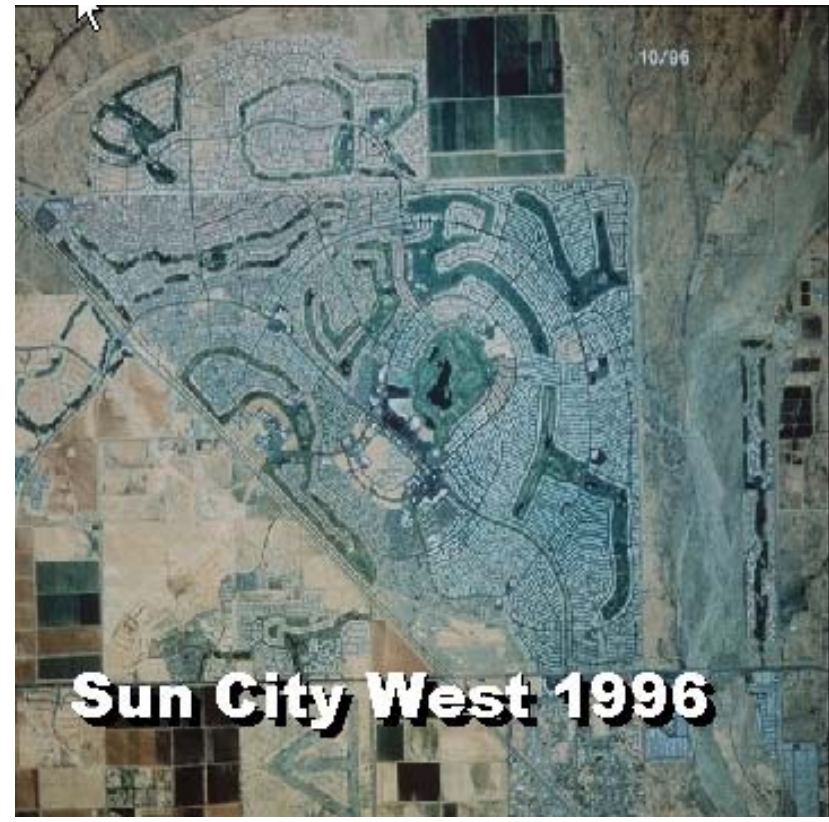
# Arizona Trends



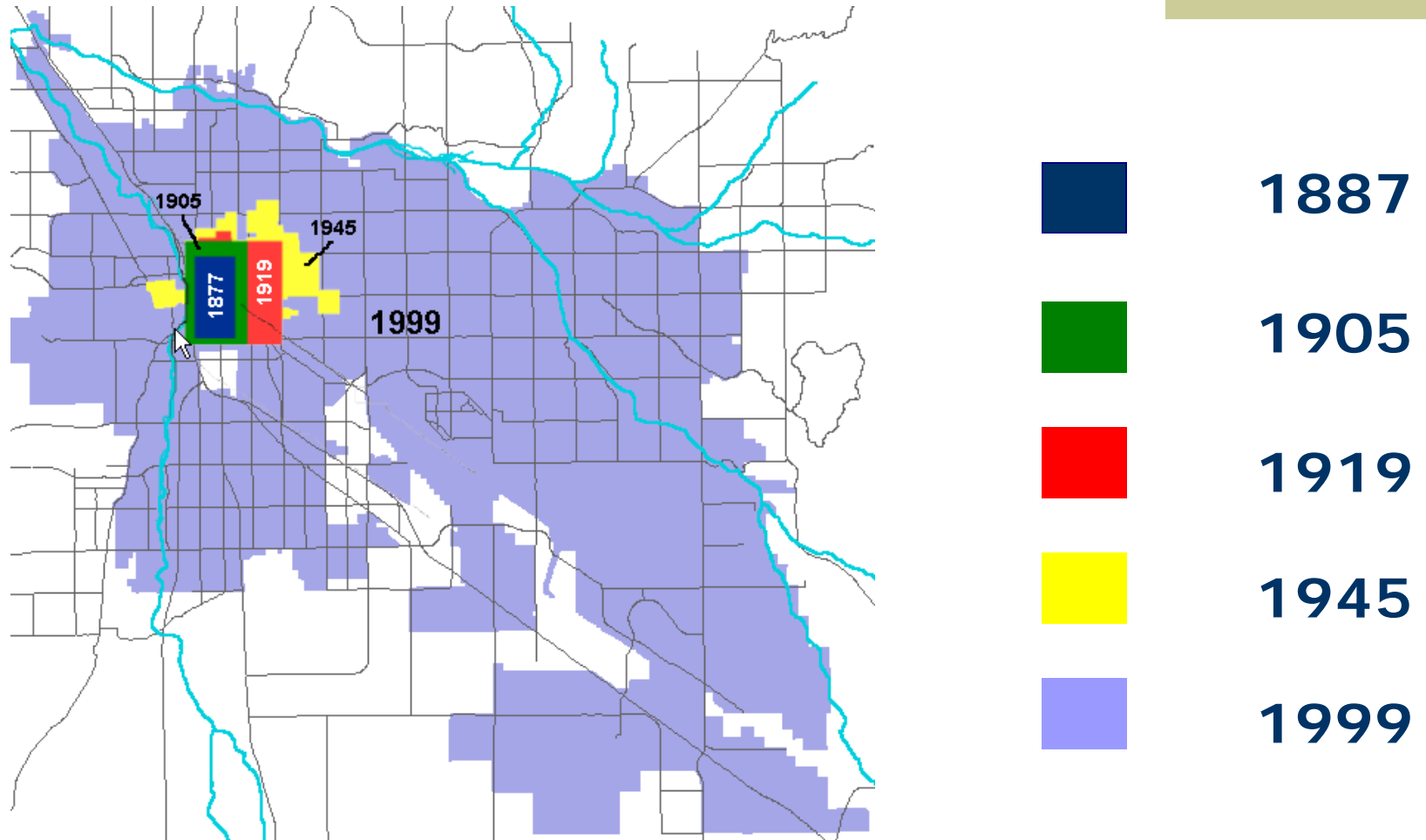
# Growth in Maricopa County



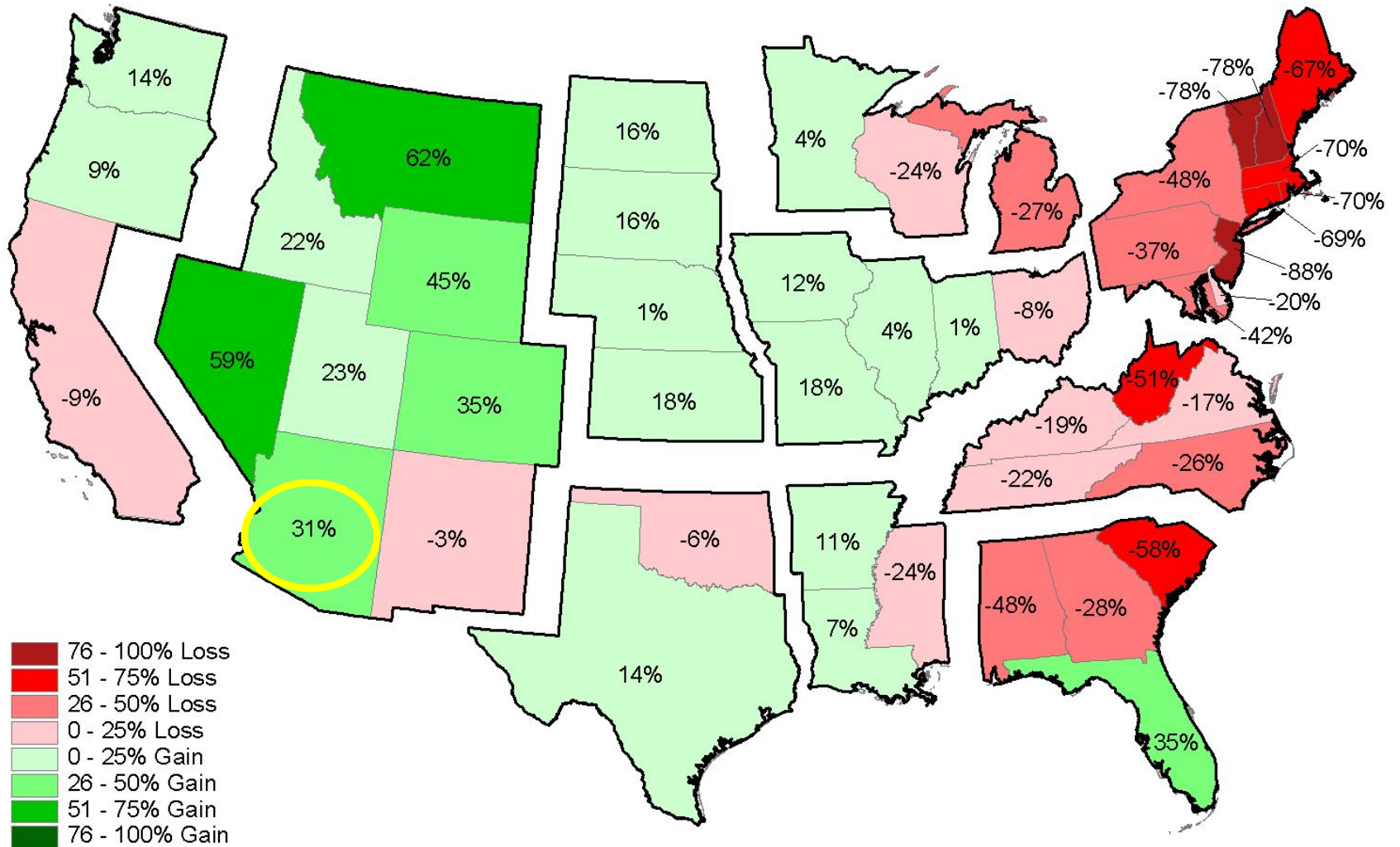
# Growth in Maricopa County



# Growth of Tucson

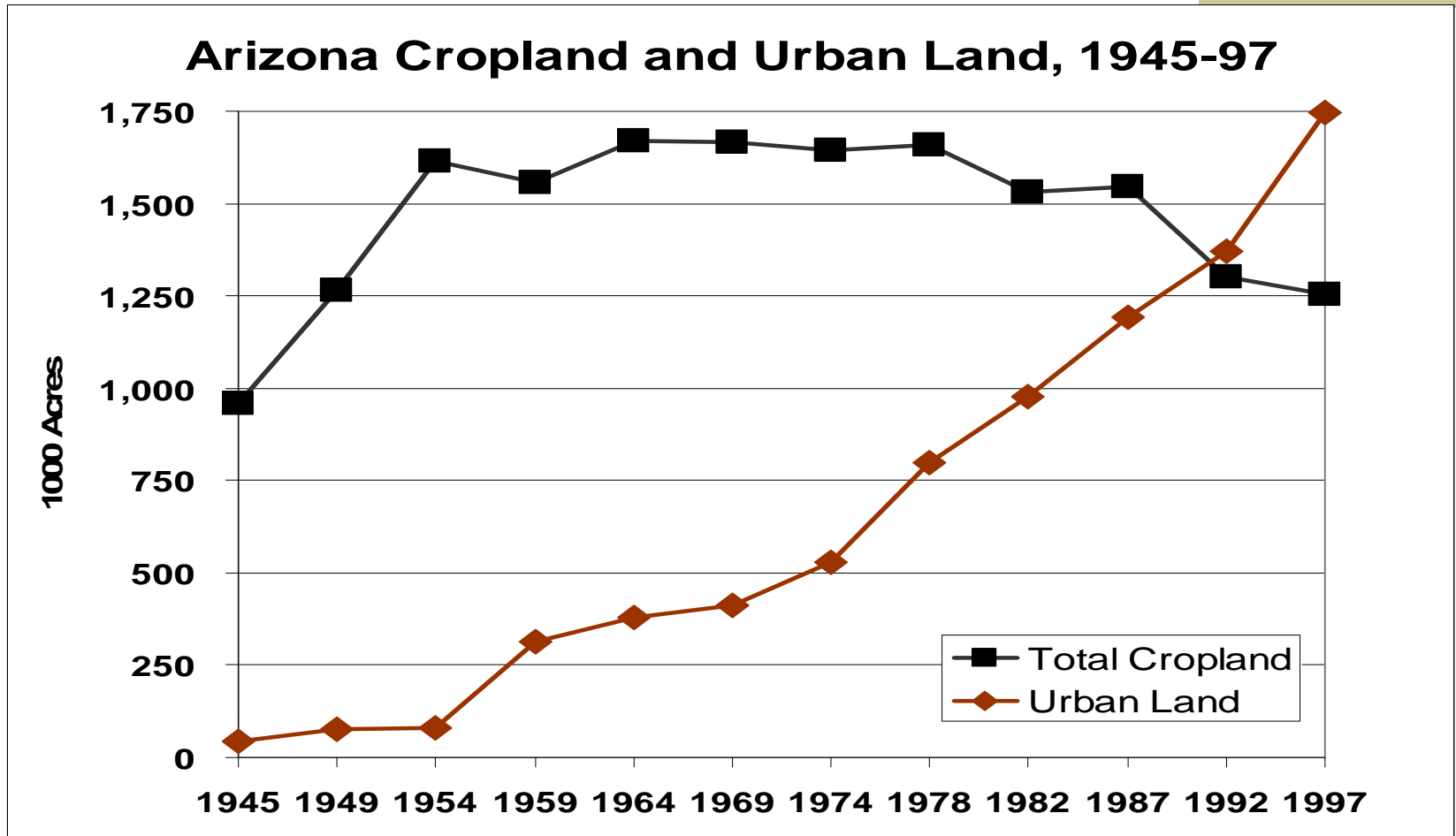


# Percent Gain or Loss in Cropland Acres 1945 to 1997

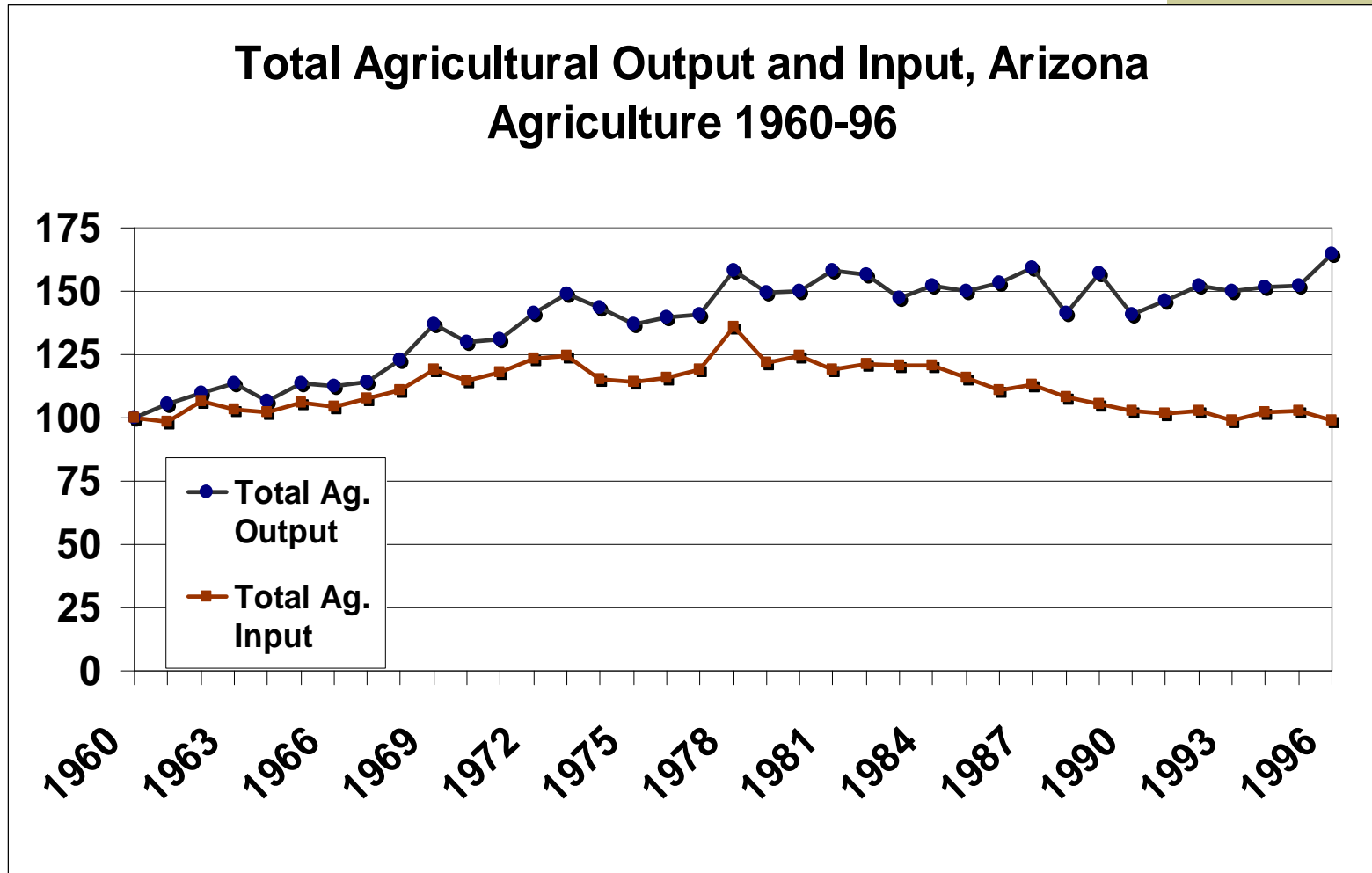


Source: Vesterby, M., and K.S. Krupa.  
 Major Land Use Data at <http://www.ers.usda.gov/data/majorlanduses/>

# Arizona Urban Surpasses Cropland by 1992

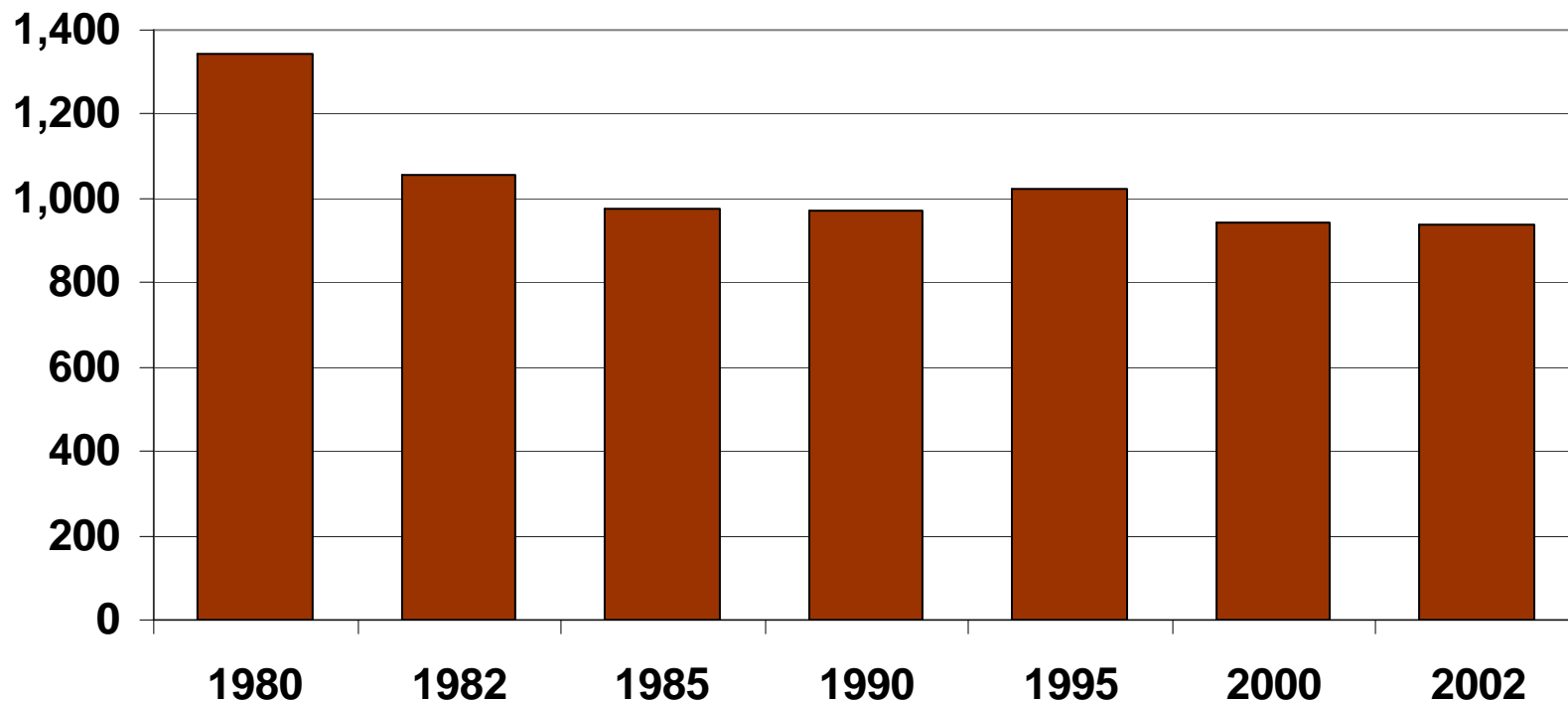


# AZ Ag Production Stable, with Declining Inputs



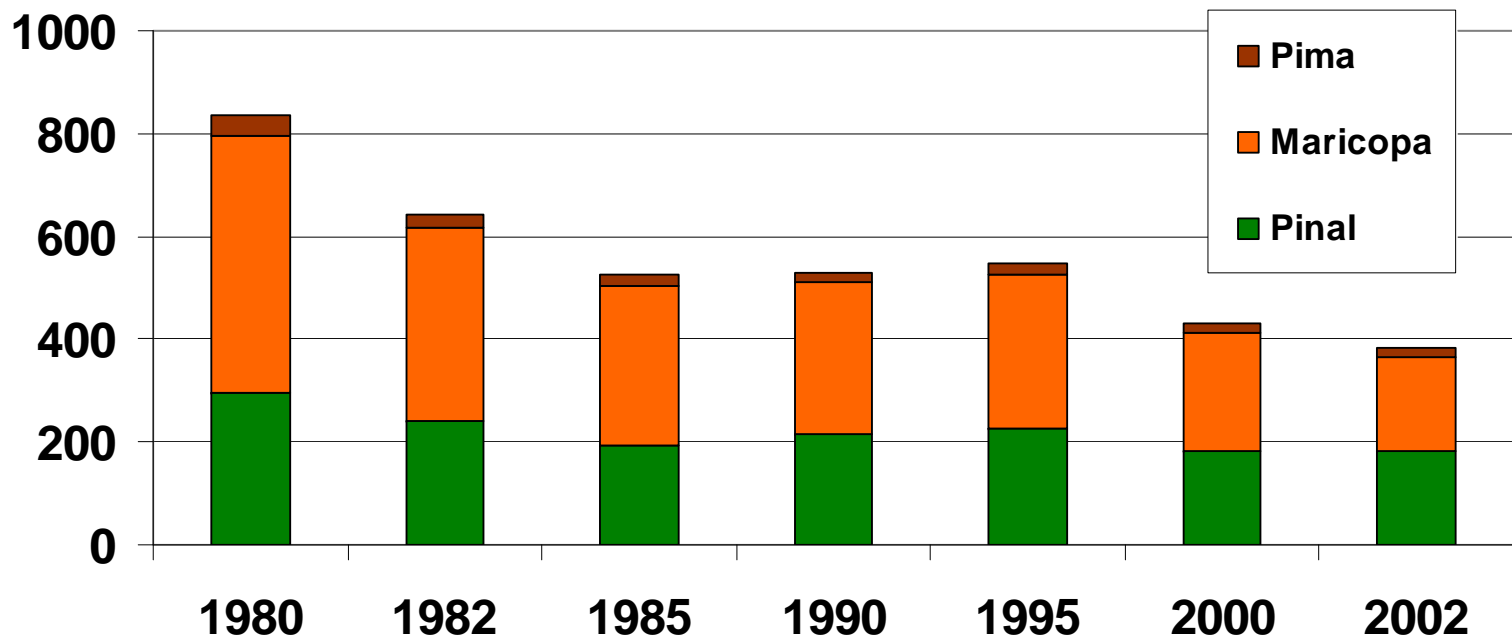
# Largest Drop in AZ Acreage in 1980s

Arizona Harvested Acres (thousands)



# Central AZ – Acreage Trending Downward

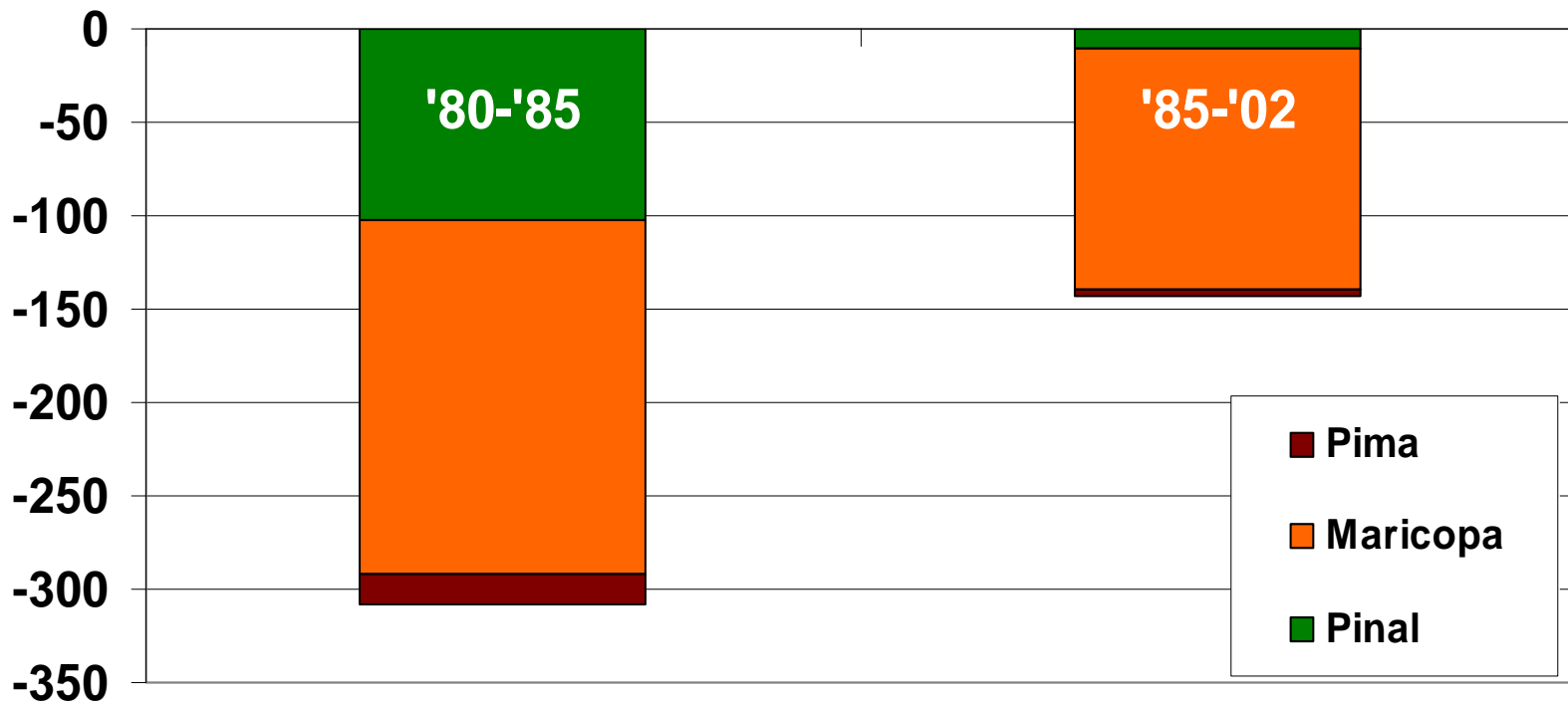
Central Arizona, Harvested Acres of Major Crops  
(thousands)



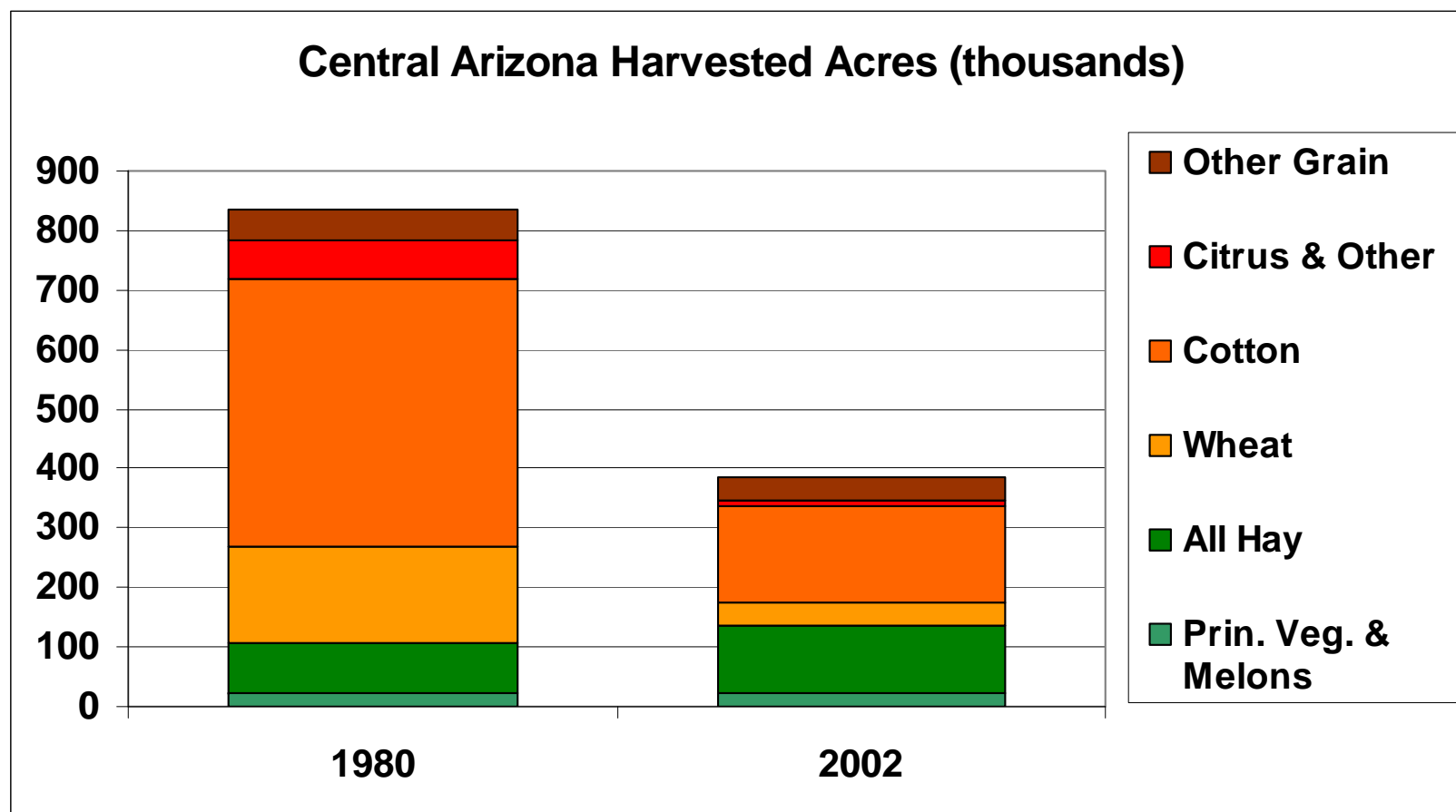


# Maricopa County Accounts for Bulk Of Central AZ Acreage Reduction

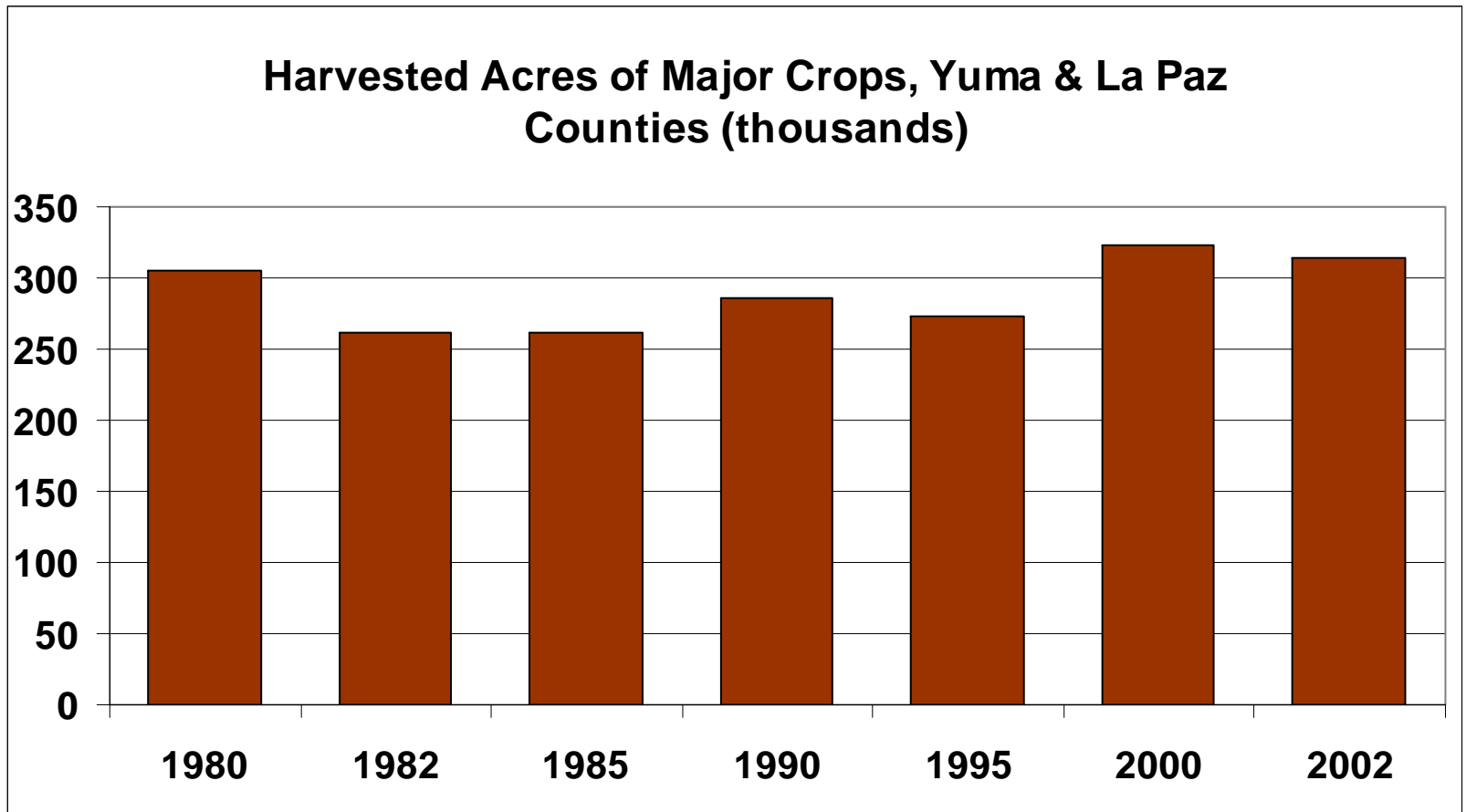
Central Arizona, Reduction in Harvested Acres (thousands)



# Central AZ: Largest Reductions In Cotton and Wheat

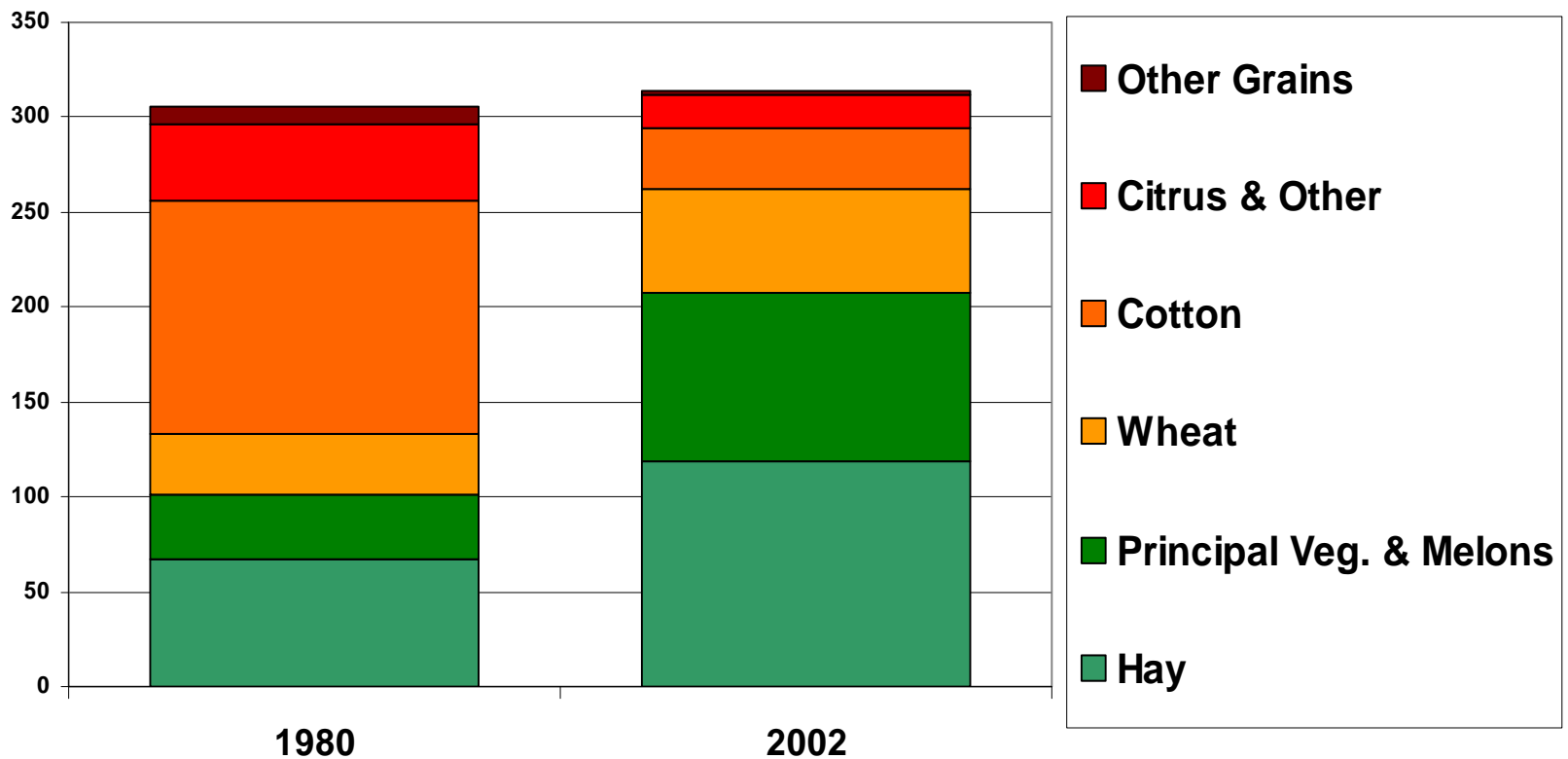


# Long Term Trend in Yuma & La Paz Harvested Cropland?

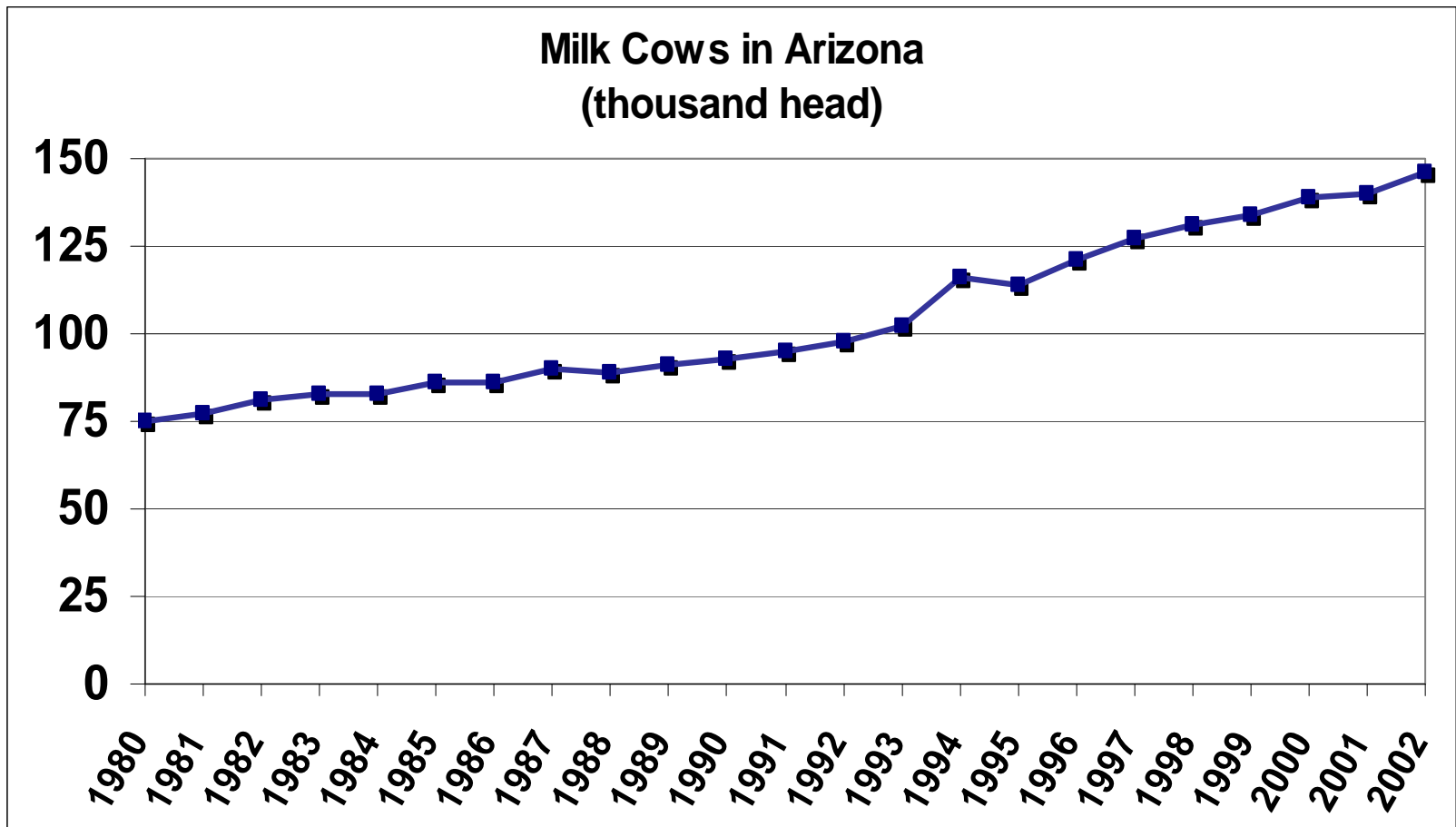


# Yuma & La Paz Acreage Shifts to Vegetables, Melons, Hay

Yuma and La Paz Harvested Acres (thousands)



# Dairy Expansion: Milk Cows Nearly Double Since 1980





# Population Projections for Selected AZ Cities

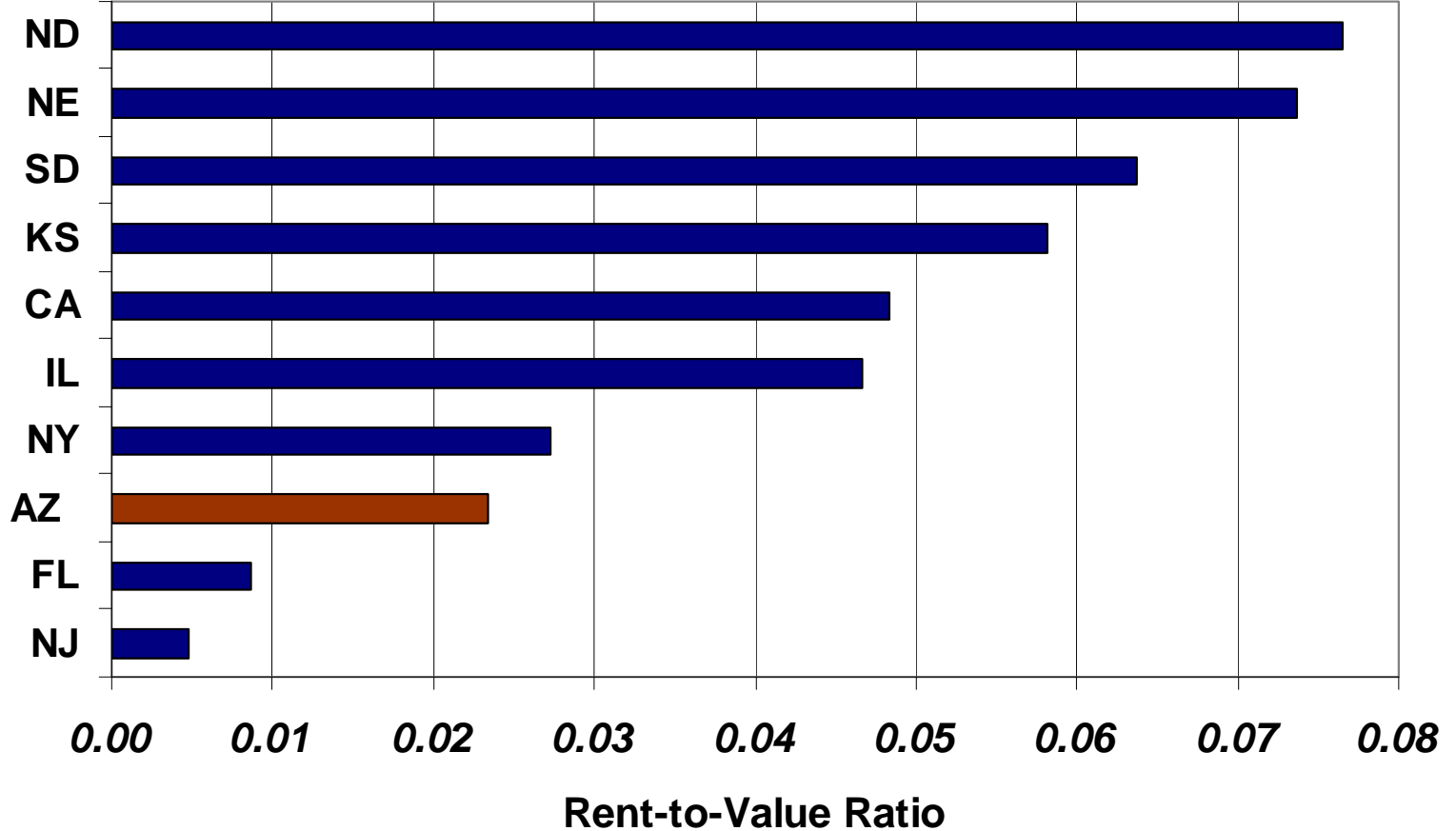
	2005	2025	2050
Buckeye	22,353	102,223	438,897
Gilbert	132,812	268,219	339,556
Chandler	198,252	271,877	322,164
Goodyear	28,204	128,809	293,050
Avondale	32,543	94,899	157,403
Queen Creek	10,659	31,882	122,312



# Population Projections for Selected AZ Cities

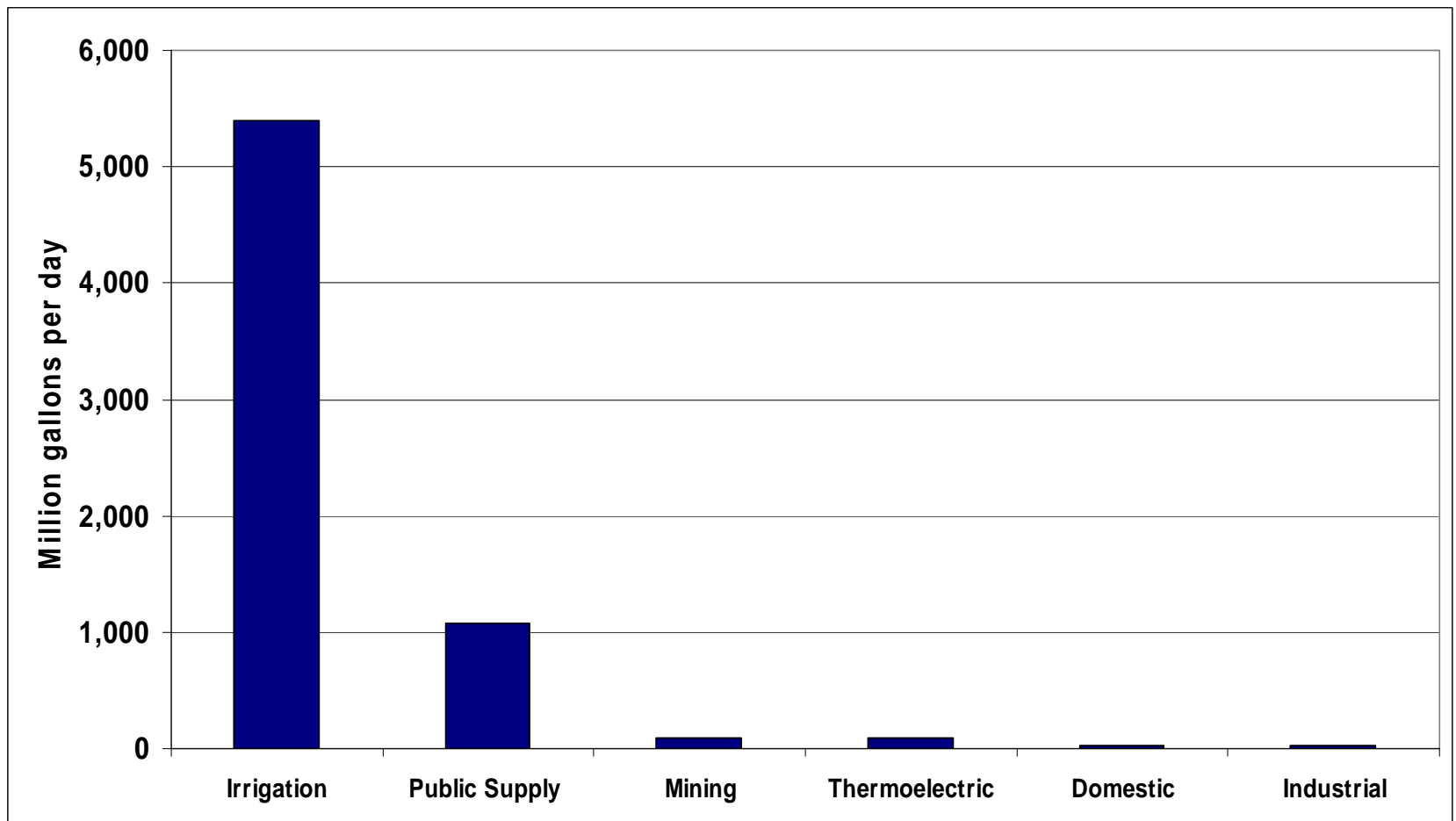
	2005	2025	2050
Yuma	74,347	108,701	154,855
Marana	29,519	88,678	124,232
Flagstaff	66,552	86,697	113,684
Prescott	38,329	53,376	65,670
Lake Havasu City	52,639	73,920	94,457

# Arizona's Low Rent-to-Value Ratio Indicates Development Influence





# Arizona Fresh Water Withdrawals by Sector, 2000





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# Arizona Fresh Water Withdrawals 2000

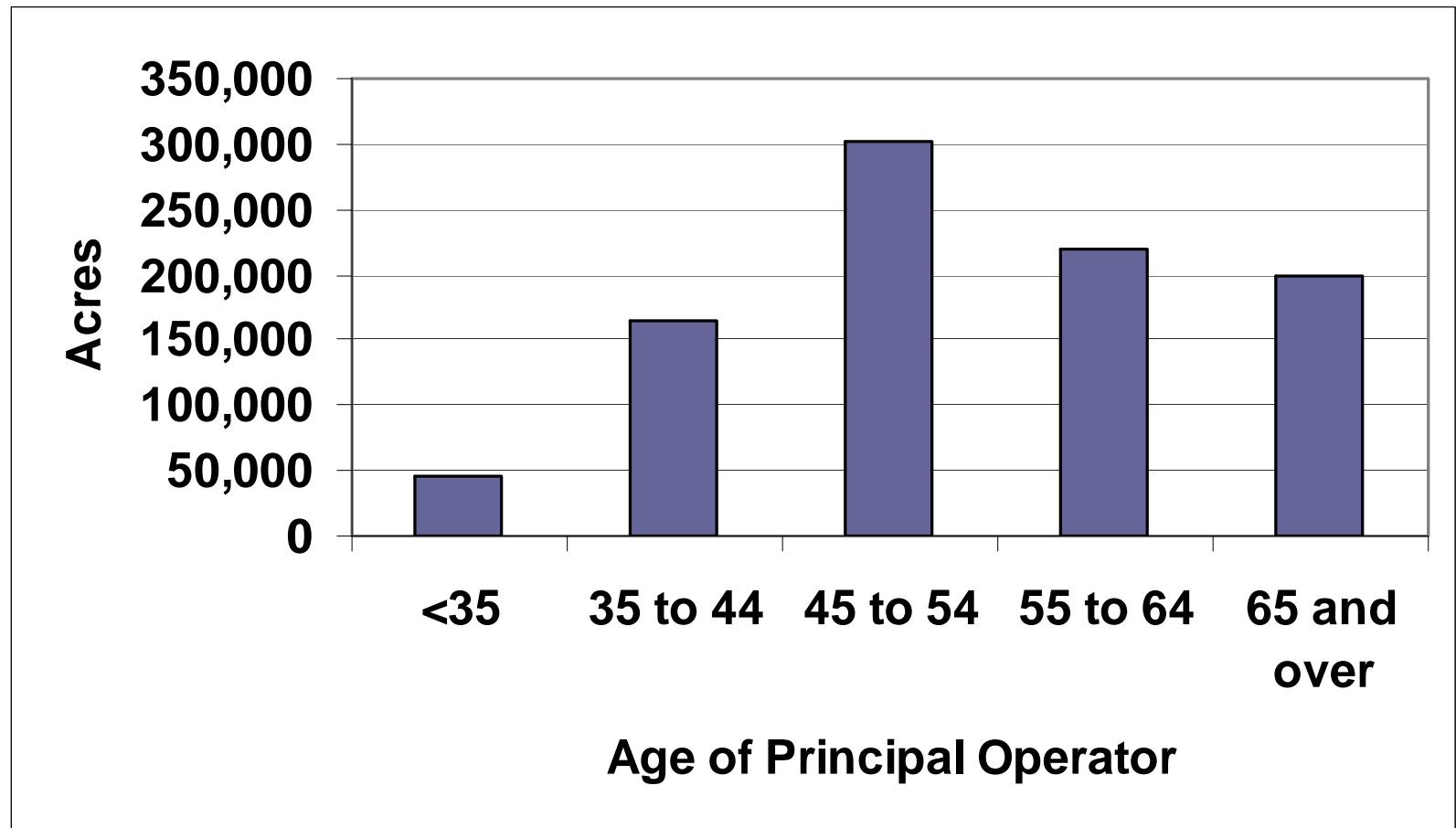
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Public Supply / Domestic withdrawals:  
0.24 acre-feet per person (USGS)

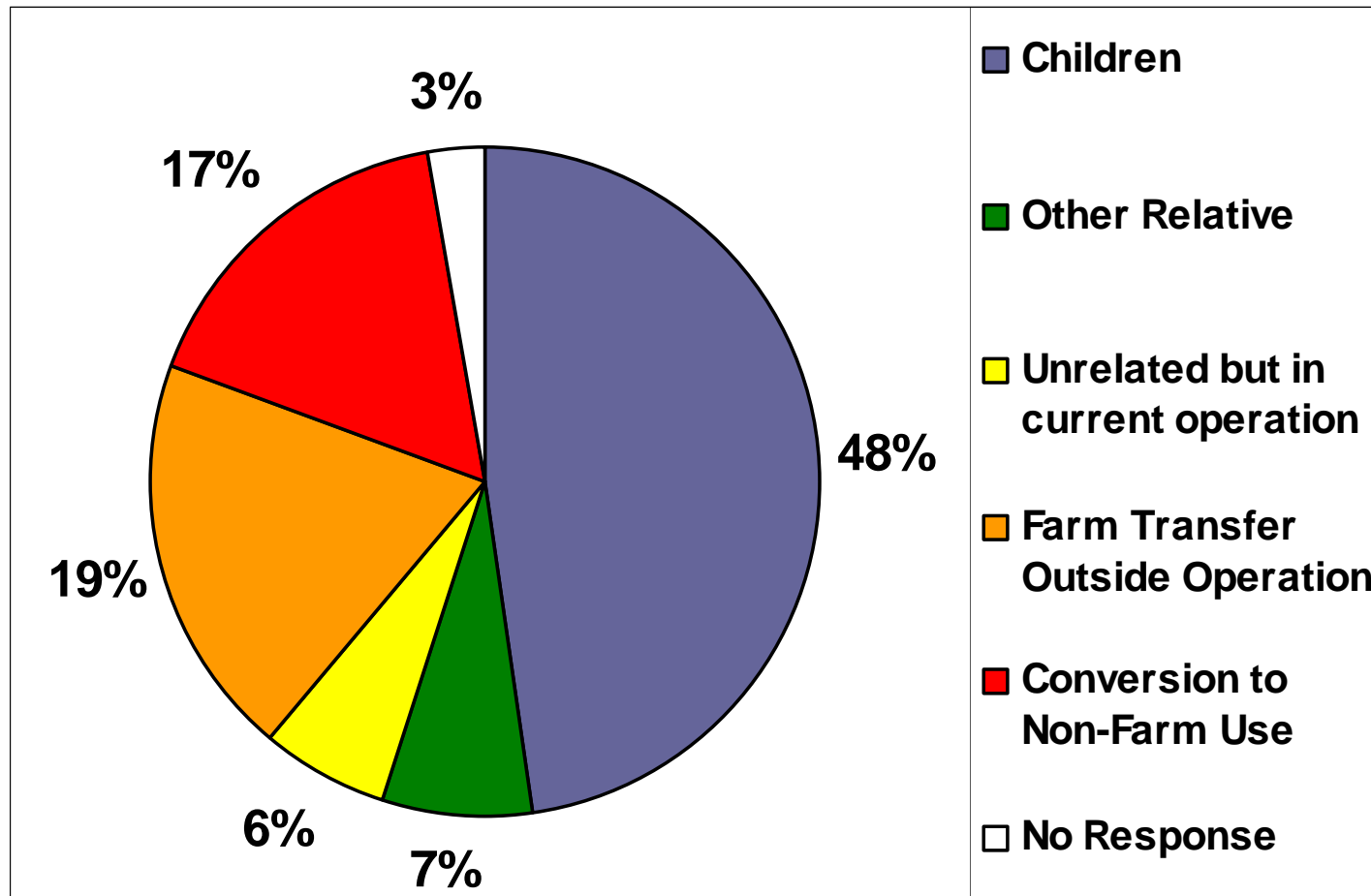
Irrigation withdrawals: 6.2 acre-feet  
per acre (USGS)

Irrigation applications: 4.5 acre-feet  
per acre (USDA)

# Arizona Irrigated Acres by Age of Principal Operator



# Expected Operator after Retirement





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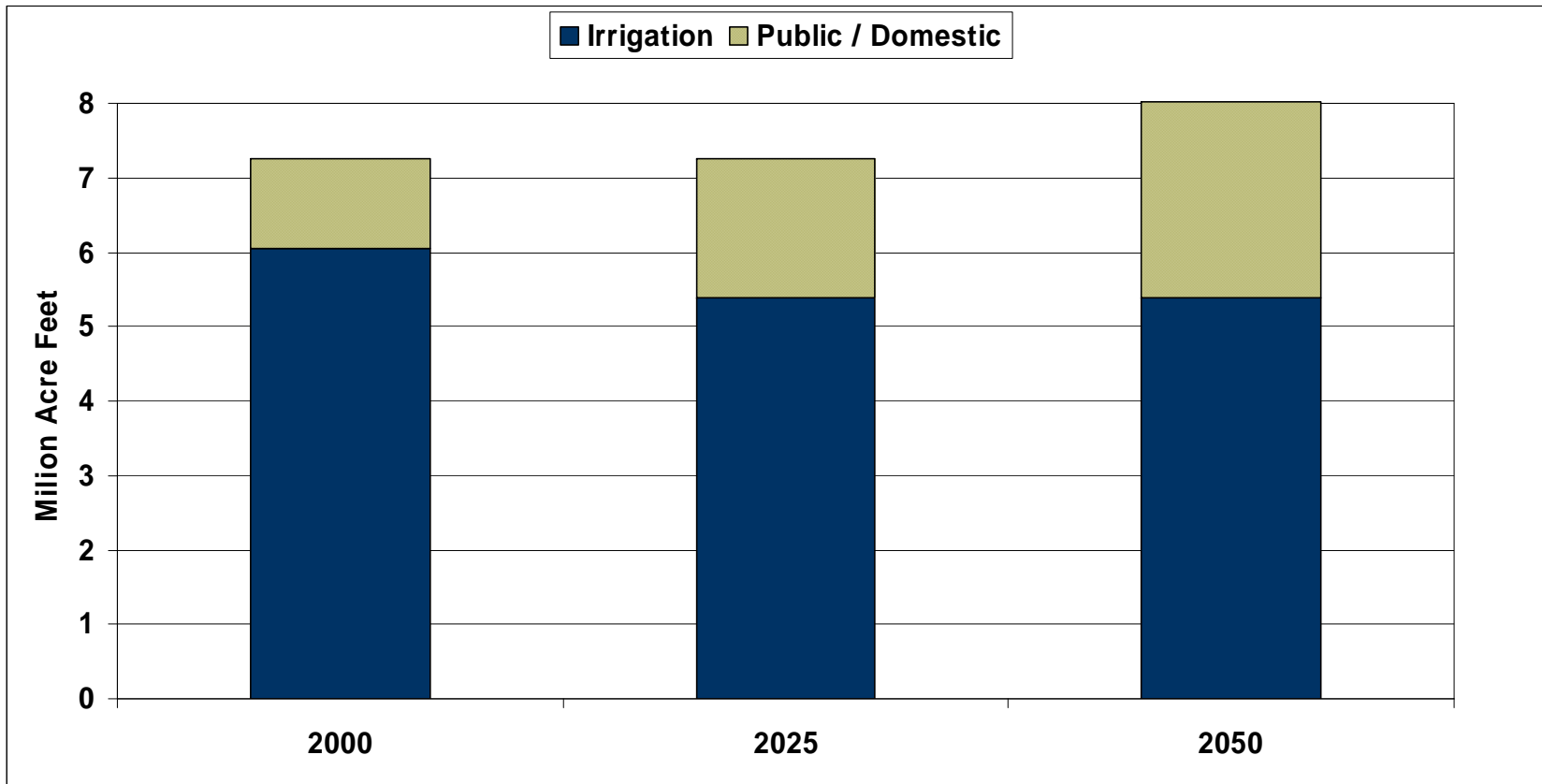
# 2003 USDA Farm & Ranch Irrigation Survey

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Operators responding they would not be farming long enough to justify investments to improve irrigation efficiency

- ◆ 2% of operations
- ◆ 12% of acreage
- ◆ 13% of irrigation water applied
- ◆ 486,000 AF of water

# Withdrawal Projections: Business as Usual Scenario



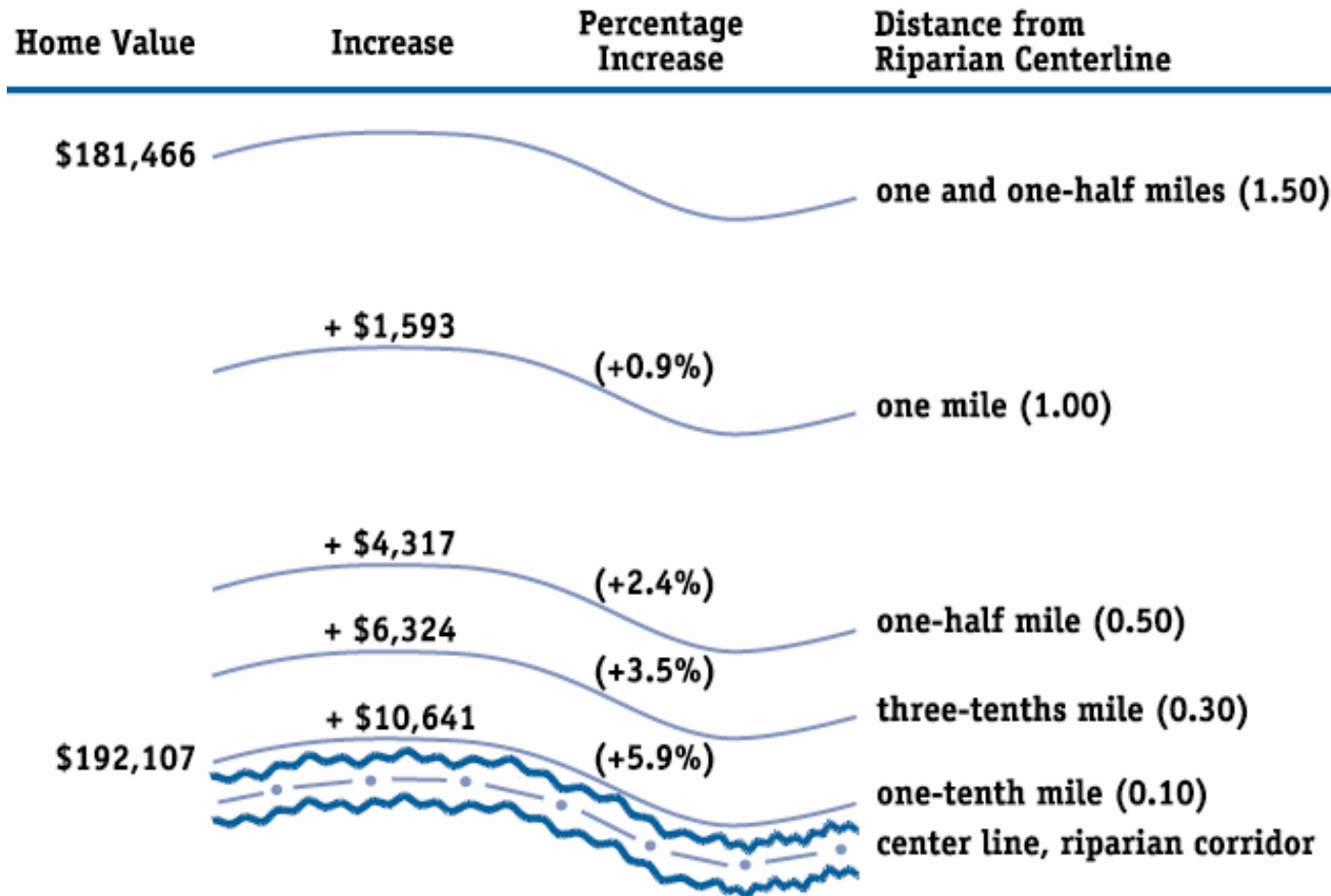
# **Property Value Premiums of Riparian Areas in Tucson**

**(Colby & Wishart Study)**

- ◆ **\$103 million premium to 25,560 homeowners who live within 1.5 miles of riparian buffer**
- ◆ **\$73 million of this premium goes to homeowners <0.5 miles from buffer**
- ◆ **Moving from 1.5 to <0.1 mile away from riparian buffer raises SF dwelling price 6%**

# Premium for Proximity to Riparian Buffer

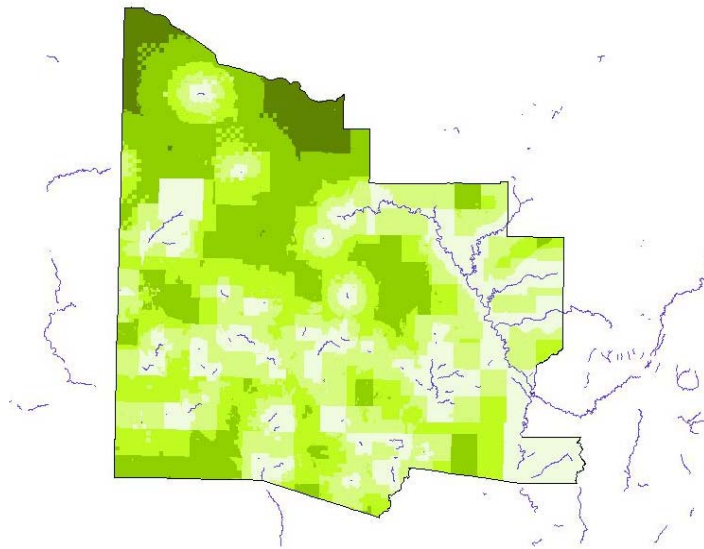
(Colby & Wishart Study)



\*2,000 square-foot, one-car garage, 15-year-old home on one-quarter acre (1999 northeast Tucson home values)



# Ranchette Premium for Proximity to Water / Rivers (Sengupta & Osgood study)



20 0 20 40 Miles



Rivers  
Distance to rivers (miles)

0 - 2.09
2.09 - 4.4
4.4 - 7.07
7.07 - 13.47
13.47 - 23.57

**A 1% increase in index of greenness increases values \$1,416/acre**

# Premiums by Type of Riparian Vegetation

(Bark-Hodgkins et al. study)

- ◆ Premiums within 0.2 miles of riparian buffers, by type of vegetation
- ◆ Largest premiums near washes with intermittent, greater species richness, and species relying on shallow groundwater
- ◆ Implication: lowering water table could affect vegetation and directly affect property values



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# Summing Up

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Shifting land uses not a threat to US food & fiber production (Ag R&D and productivity growth remain key )

Overall AZ production stable since 1980, but significant changes in crop mix and location



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# Summing Up

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Over next 20 years, a relatively orderly reallocation of water from agriculture to urban use will keep water withdrawals relatively stable

Sustainable withdrawals will require more changes after 2025

Prolonged drought will make balancing supply and demand that much more difficult



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# Summing Up

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- ◆ Past and ongoing AREC research suggests riparian areas significantly affect residential property values
- ◆ Changes in land and water use that affect water tables and vegetation directly affect property values