



New Mexico State University

Structure of U.S. Agriculture

- Majority of production on few farms
 - 8% of farms ? 75% of total value of output
 - Farms with >\$250,000 annual sales
 - Definition of a “farm”?
- 60% of U.S. farms sell less than \$10,000 / yr
- Off-farm work
- Retirement or residential - lifestyle farms
 - 54% of all U.S. farms ? 8% of output value

What does this mean?

- Chronic negative net farm incomes for many “farms”
- Agriculture is a “consumption” activity subsidized by off-farm earnings
- Residential – lifestyle farms
 - Average household income \$72,081
 - Average farm earnings -\$4,309

Irrigation in the West

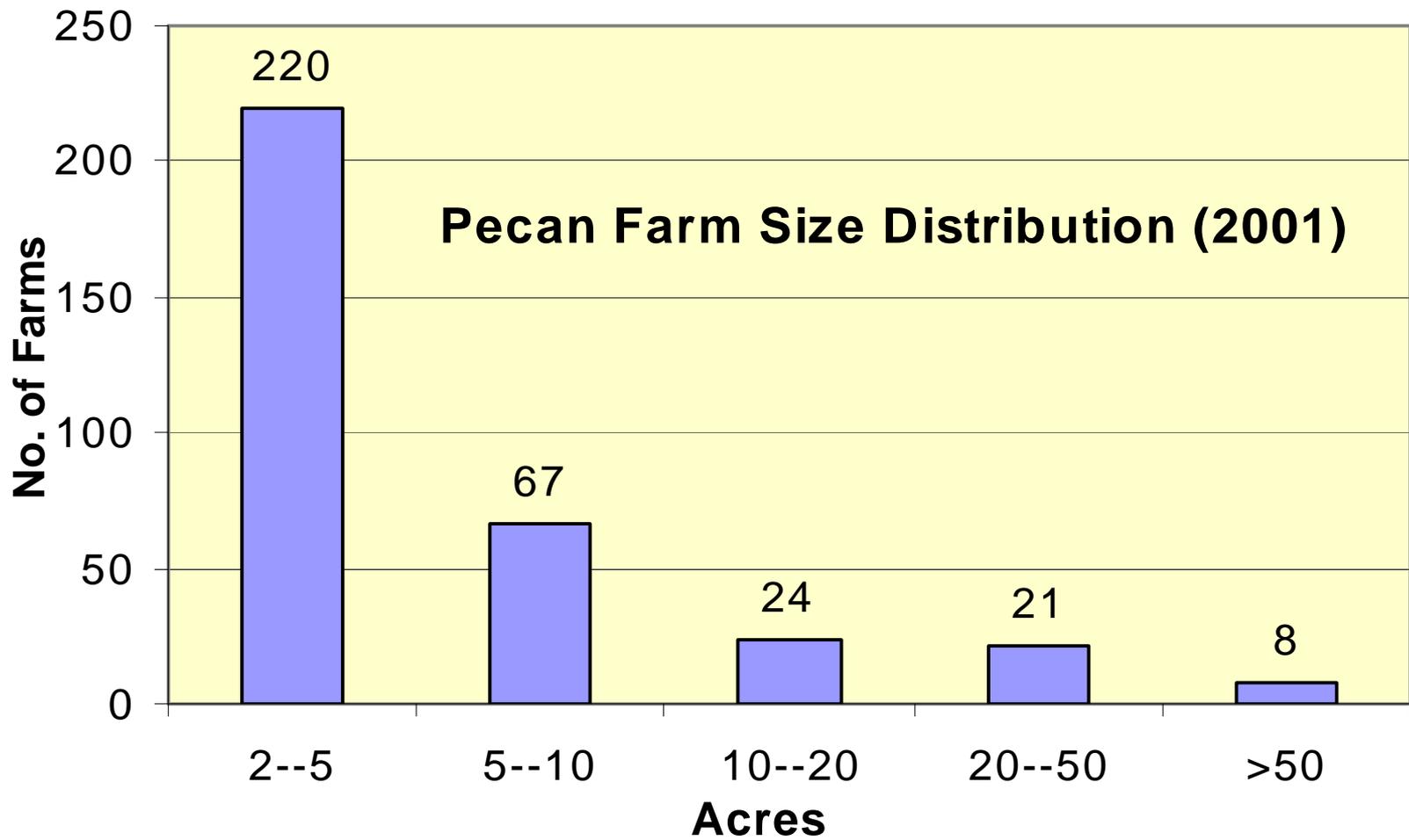
- Urban fringe agriculture in western river valleys
- 92% of consumptive water use
- Increased competition for water supplies
 - Municipal & Industrial
 - Environmental
- Increased irrigation efficiency & water marketing?
 - Technologies or practices
 - management intensive
 - Incentives

Elephant Butte Irrigation District

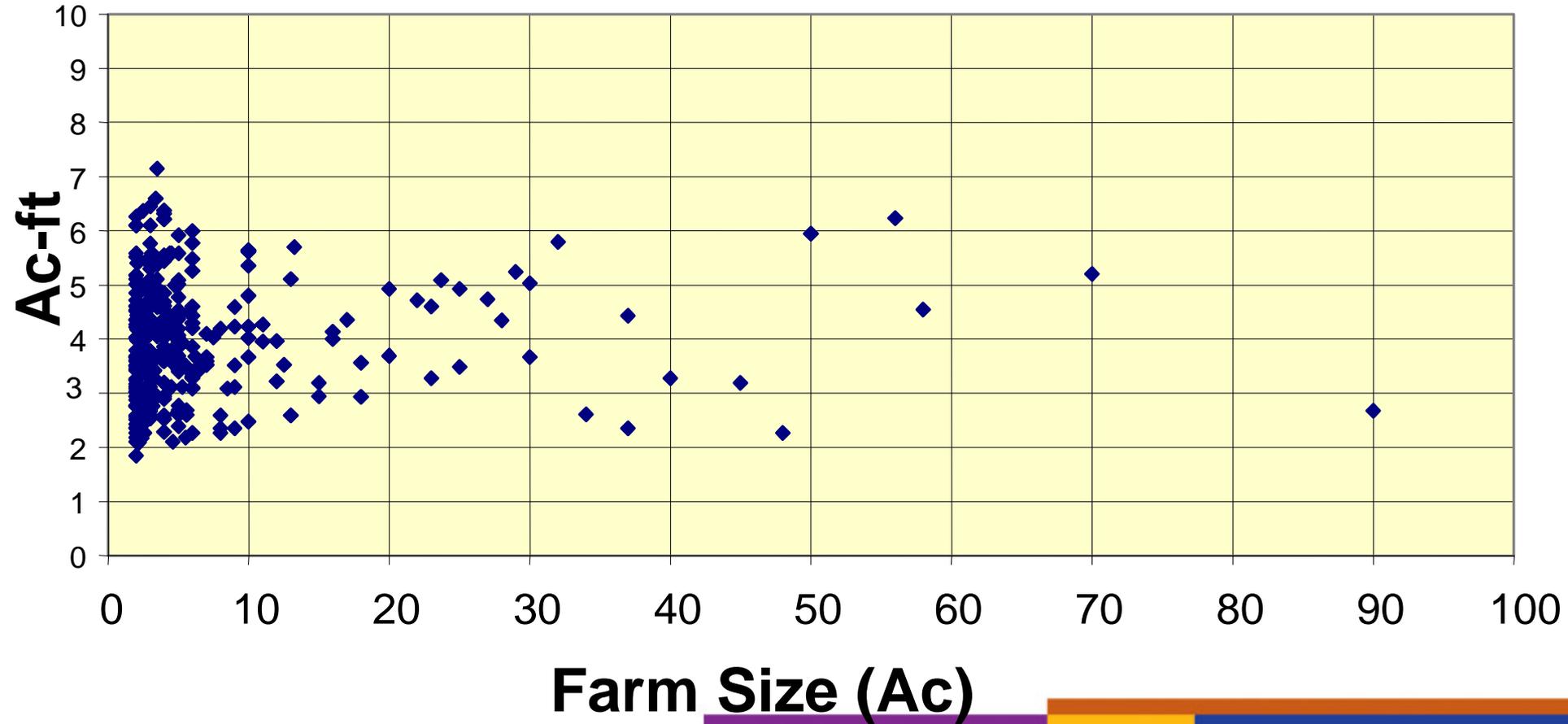
- Doña Ana County, 1974 - 2002
 - Irrigated farms increased 124%
 - 589% increase in 1-9 acre irrigated farms
- Residential, lifestyle, urban fringe agriculture
- Dual structure production (e.g., pecans)
- On-farm efficiency on commercial farms
 - 88% - 98% alfalfa
 - 79% - 94% pecans

This Research

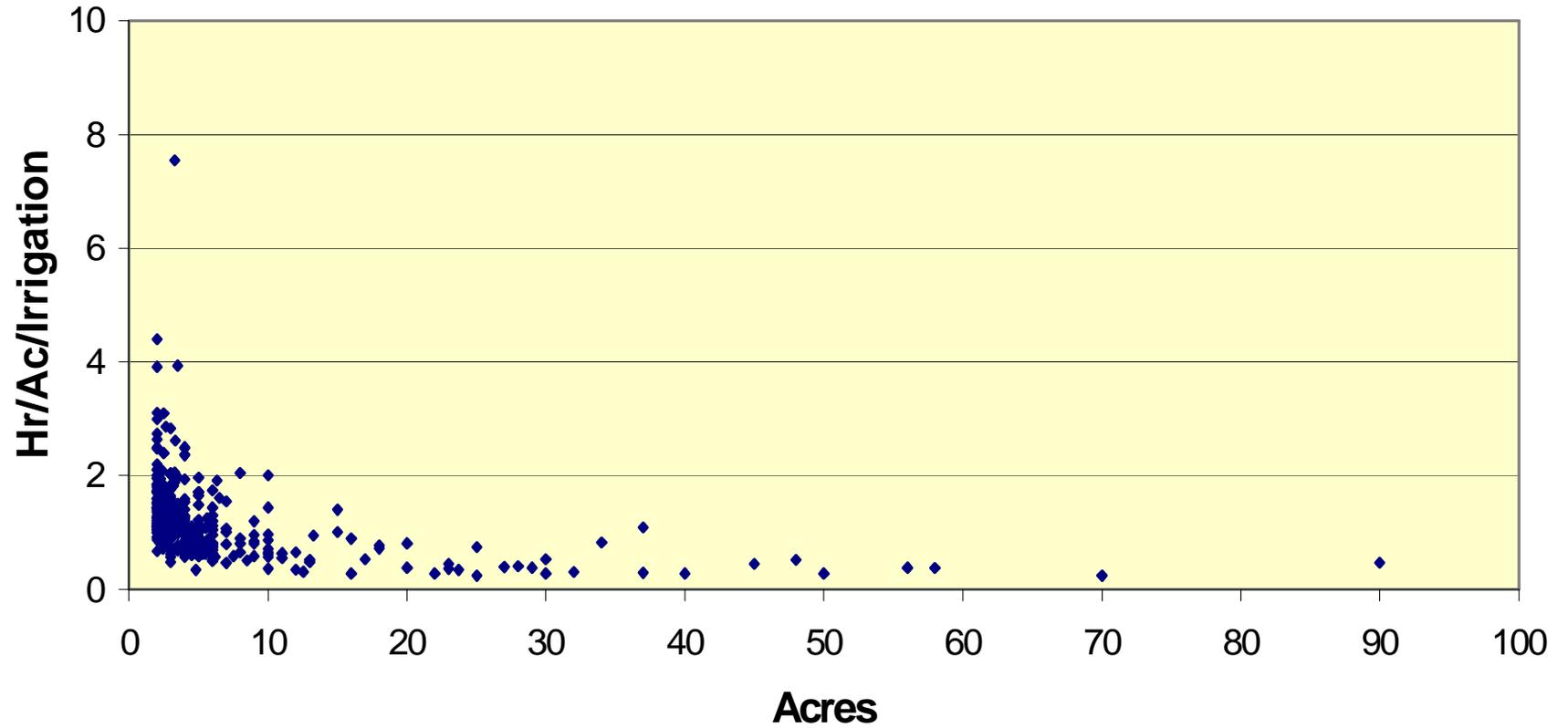
- Relationship between farm size & irrigation practices, efficiency
- Potential responses to technology, conservation incentives & water marketing
- EBID water delivery data (2001)
- 340 pecan, 524 alfalfa, 164 cotton accounts



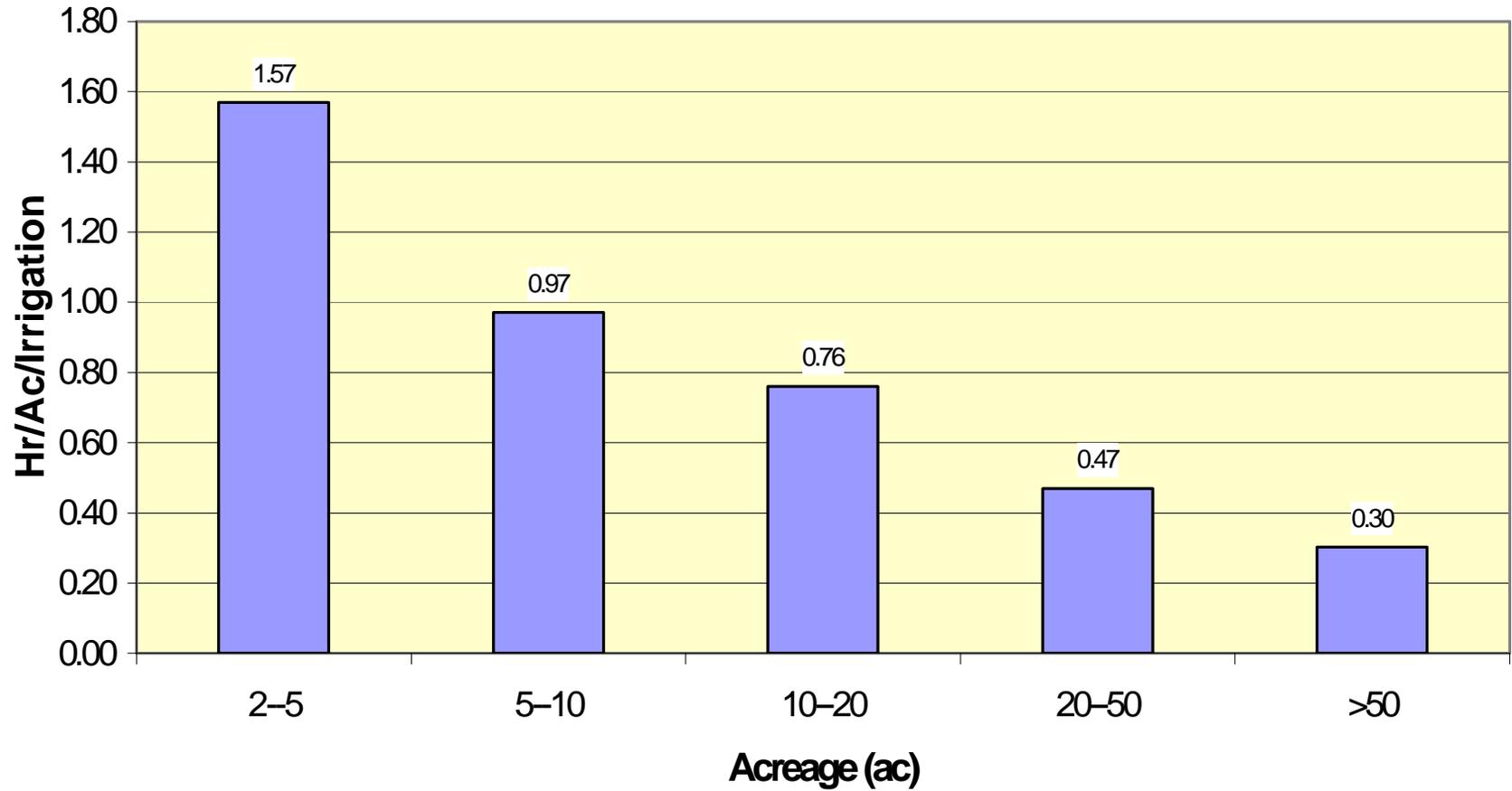
2001 Pecan Ac-ft vs Acreage



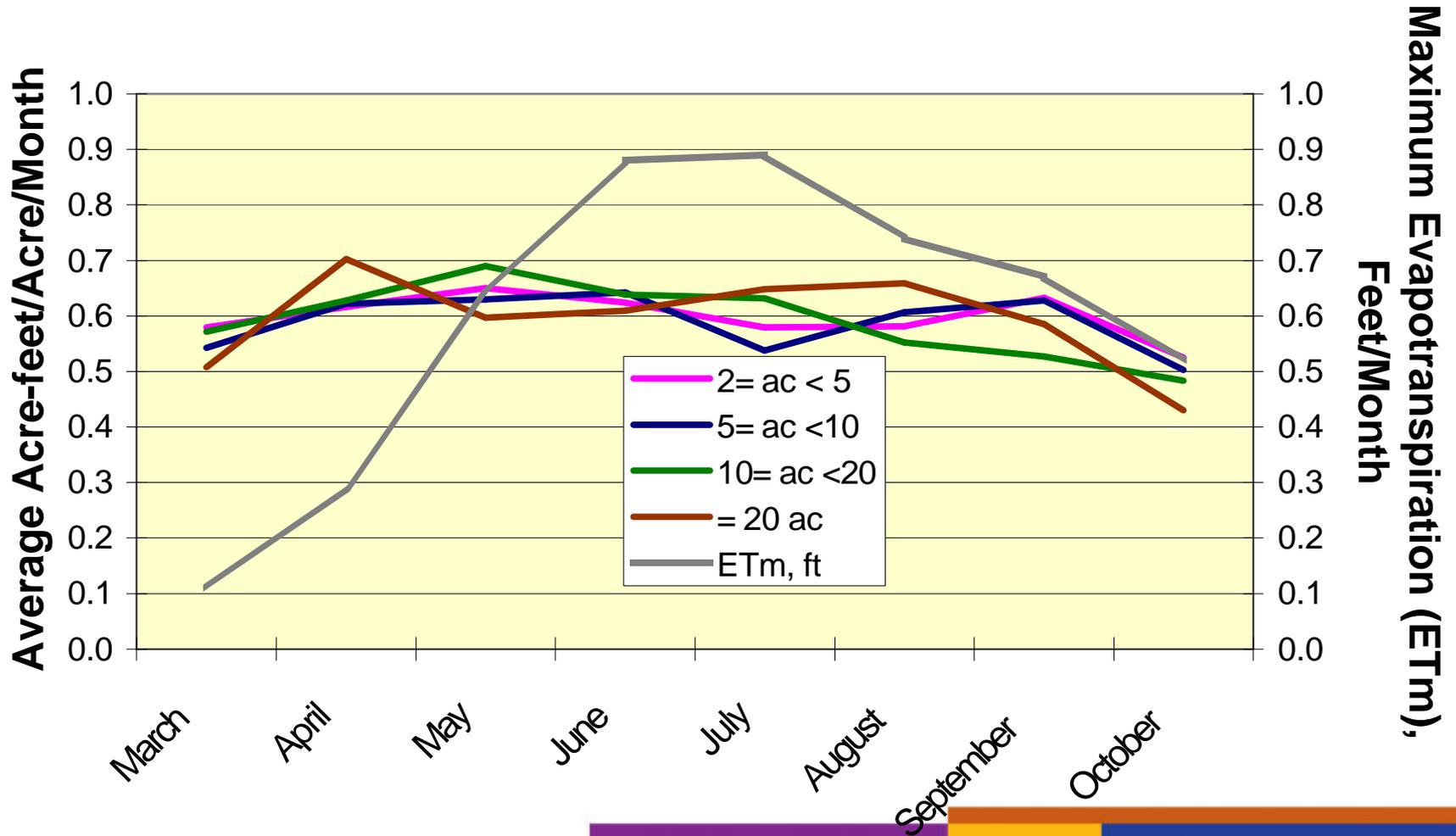
2001 Pecan Hrs/Ac/Irrigation vs. Farm Size



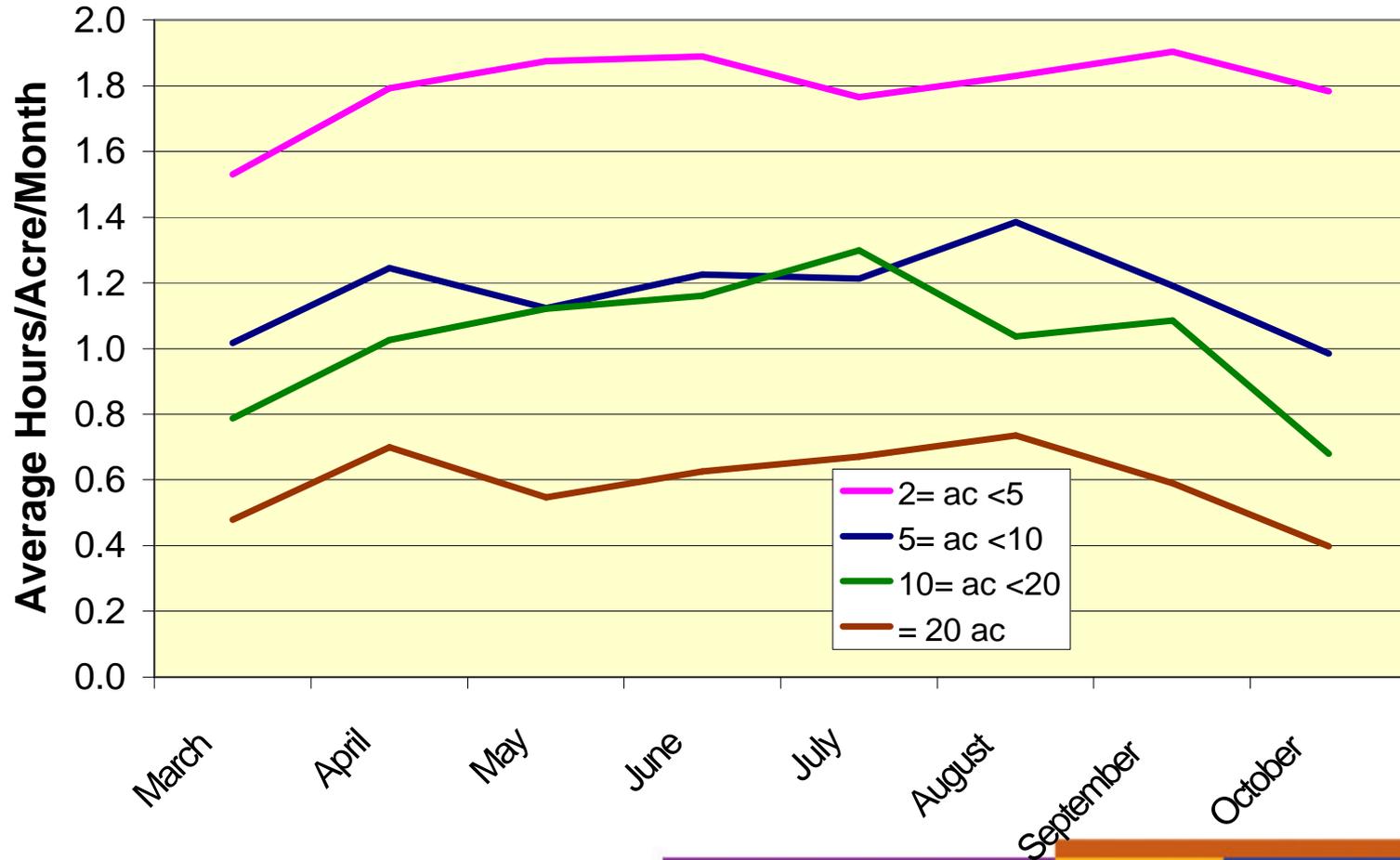
Pecan Average Hrs/Ac/Irrigation (2001)



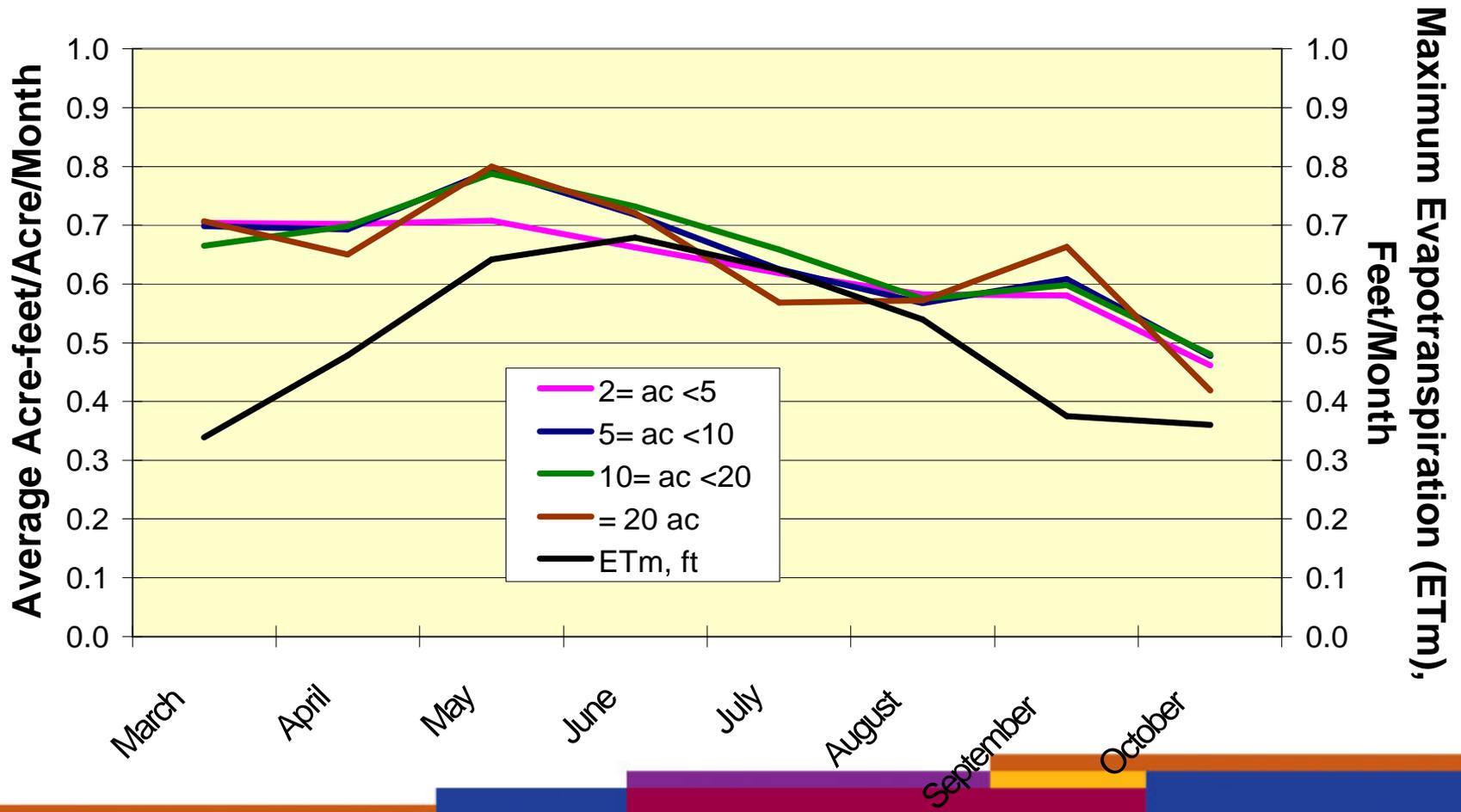
Pecan Ac-Ft/Ac & ET by Farm Size



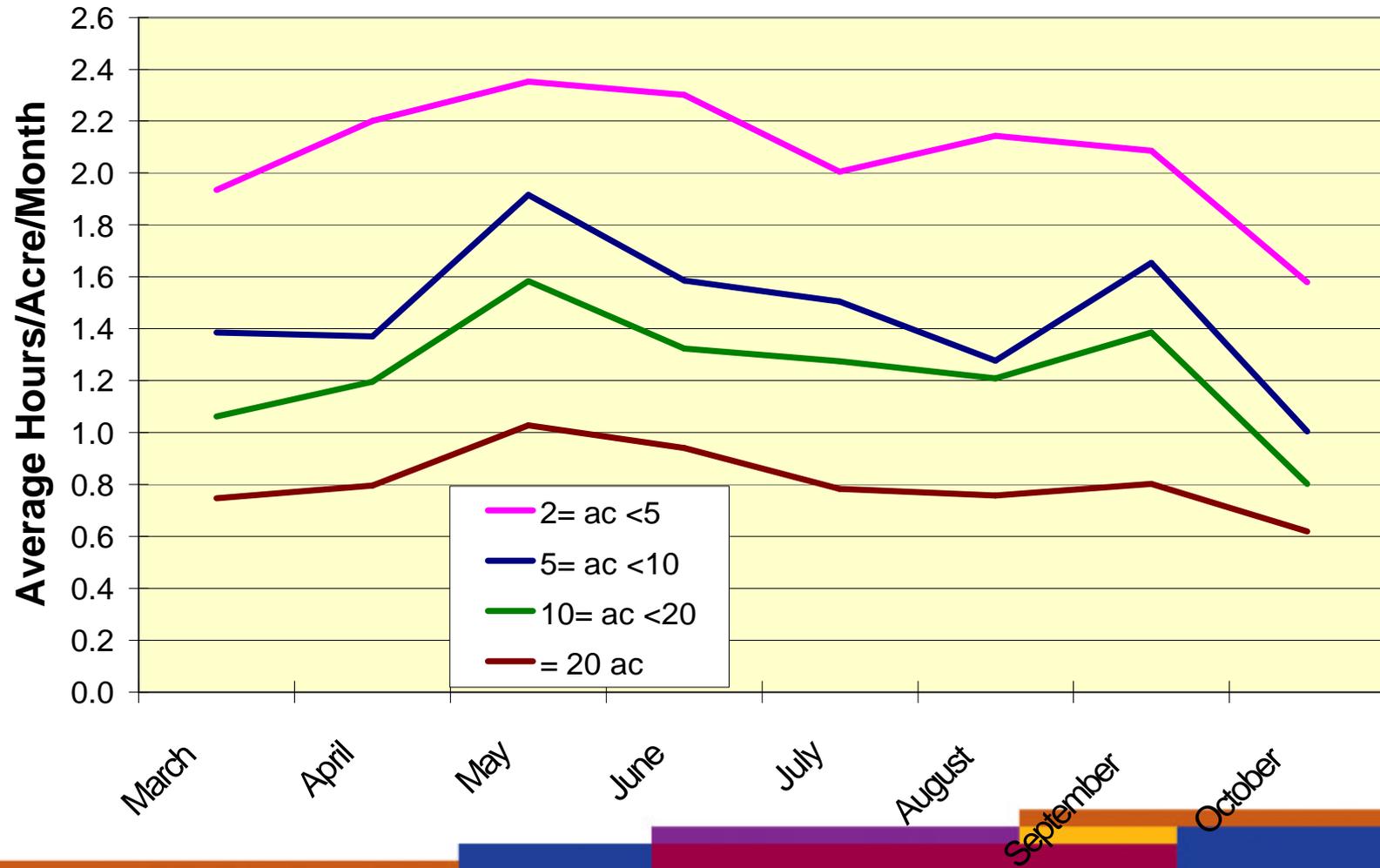
Pecan Irrigation Duration by Farm Size



Alfalfa Ac-Ft/Ac & ET by Farm Size



Alfalfa Irrigation Duration by Farm Size



Irrigation Duration...

- Hours / acre / irrigation
- Indicator of irrigation efficiency
 - Deep percolation losses
- Guideline = 0.5 hrs/ac/irrigation

Field Verification

- Highly permeable soils
 - Low flows at farm turnout
 - Small farm turnouts
 - Long, unlevelled fields, rough surfaces
 - Inadequate infrastructure
 - Poorly maintained ditches
 - Easements, access, common property disputes

 - Irrigation...
 - Recreation
 - Tradition
- ~ Lifestyle
- ~ Meditation

Small Farm Irrigator Comments

- Low involvement small farm irrigators...
 - “Nobody else does anything to maintain the ditch, why should I?”
 - “Nobody wants to spend any money on the ditch.”
- High involvement small farm irrigators...
 - “I’m retired, what else have I got to do?”
 - “I like to listen to the water.”

Findings...

- Overdelivery to small farms
- Underdelivery to large farms
- Delivery losses or on-farm application?

- Small orchard nut production
 - 161 lbs / acre-foot (\$103.04/acre-foot)
- Large orchard nut production
 - 300 lbs / acre-foot (\$185.60/acre-foot)

Conclusions...

- “Recreational” irrigators are unlikely to respond enthusiastically to technology or water marketing incentives.
- Many water users are “paying to play.”
- Irrigation technologies are scale biased.
 - Management intensity of commercial & lifestyle farms?

Conclusions...

- Irrigator population is very diverse.
 - Profit maximizers?
 - Utility maximizers?
 - Cost minimizers?
- Efficiency increases on commercial farms are likely to be small & costly.
- Existing irrigation structures were designed for early 20th century agricultural structure.
 - Reinvestment?

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