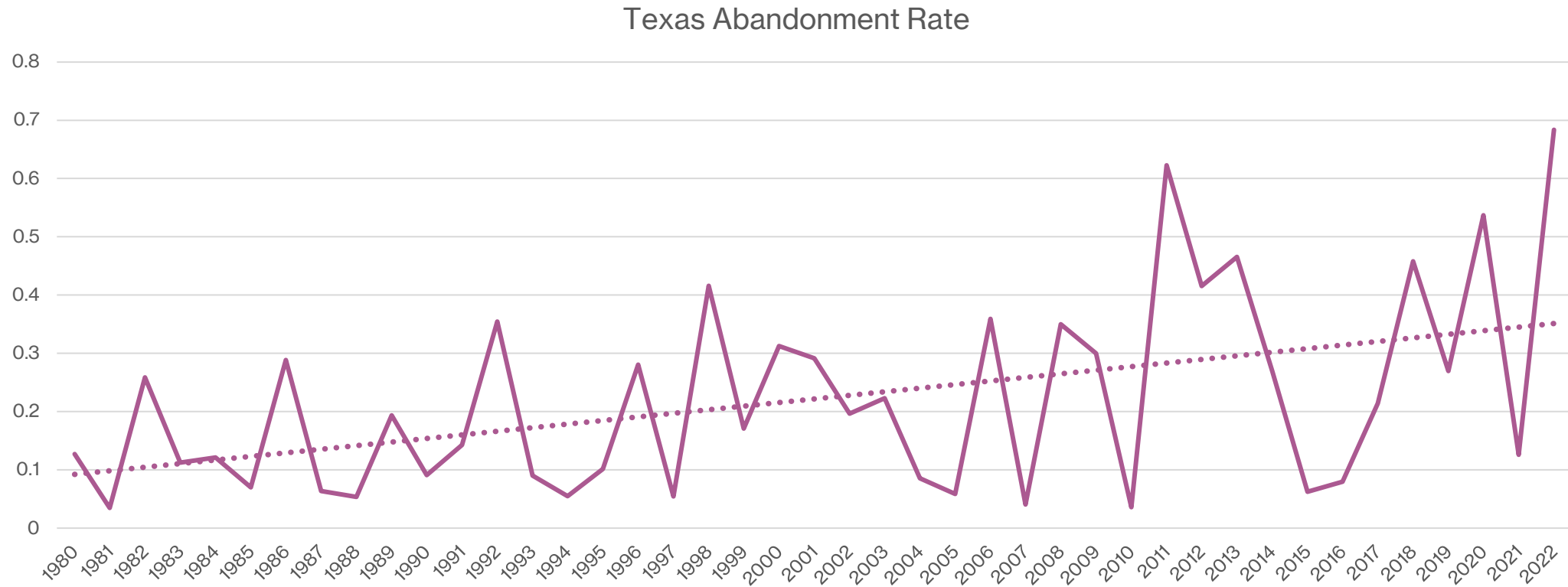# Cotton Abandonment

Darren Hudson

Combest Endowed Chair

Assoc Dean for Strategic Initiatives
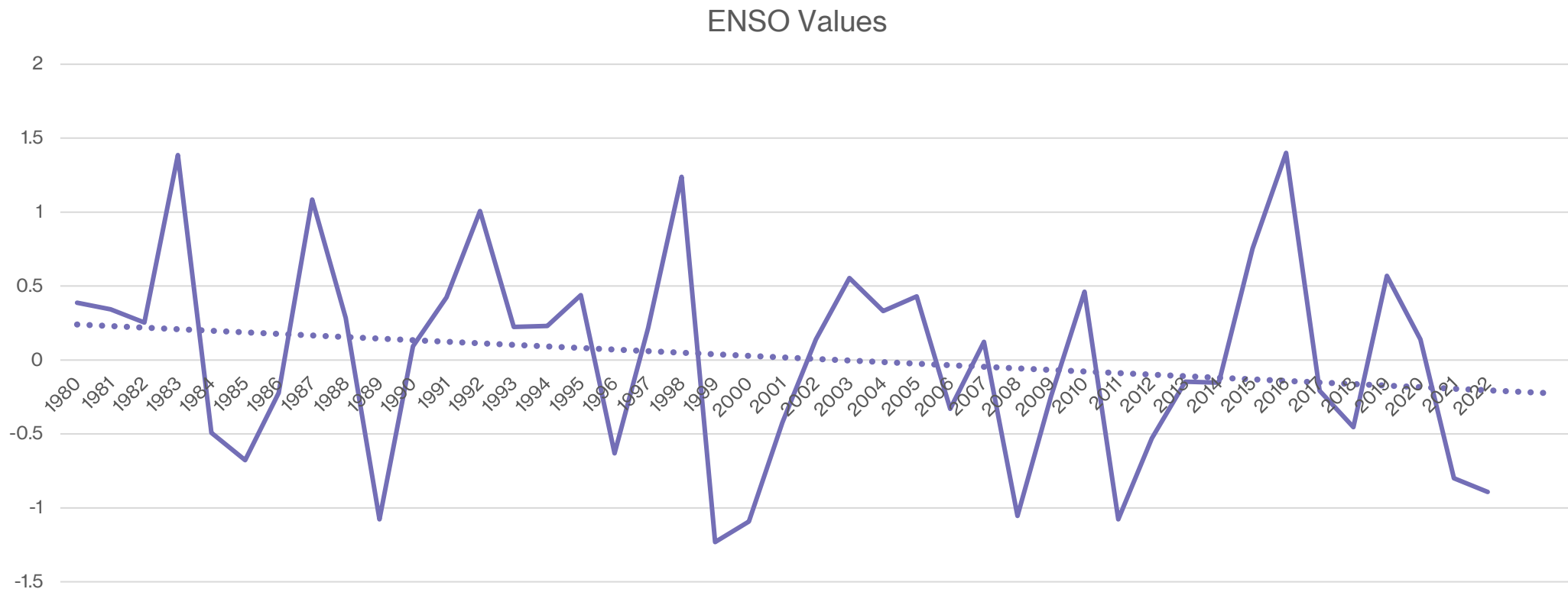
Texas Tech University

Abandonment

- Abandonment is believed to be caused by a variety of factors:

  - Weather and related variables, obviously

  - Crop insurance benefits

  - Farm bill attributes
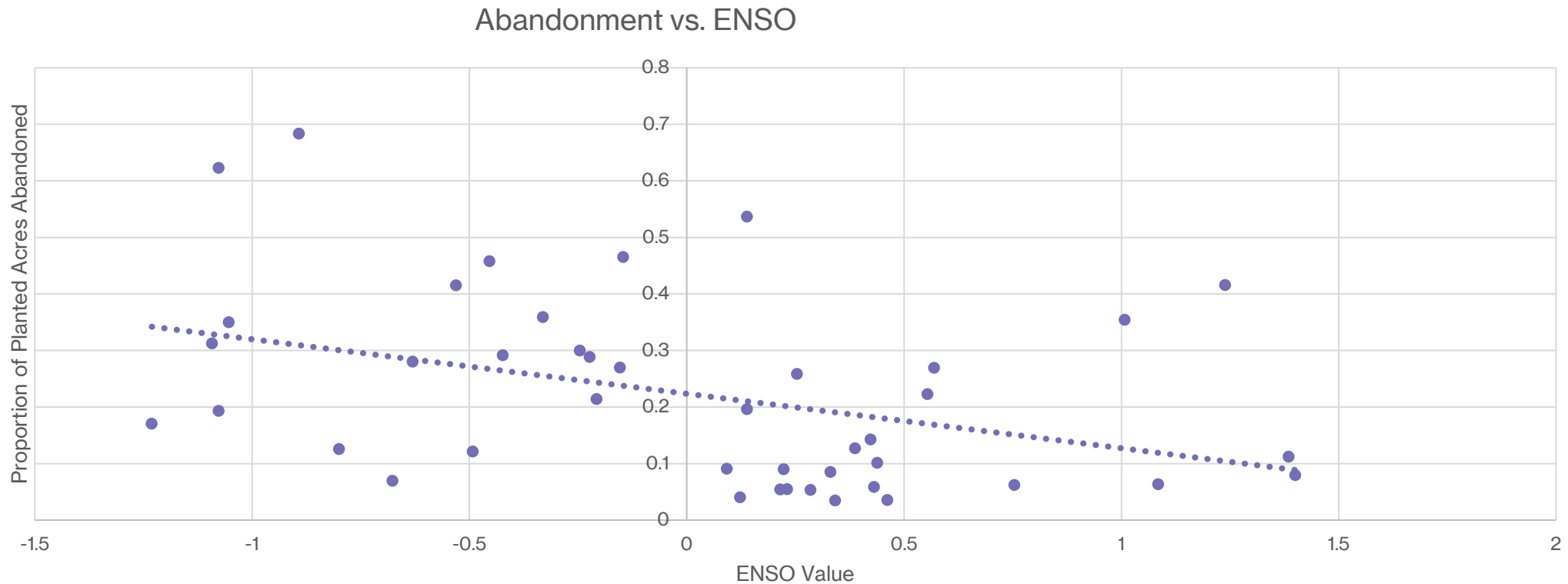
  - Cost of production

Texas Abandonment

Texas Abandonment Rate

Source: USDA, NASS

El Niño/La Niña-ENSO Values

ENSO Values

Average ENSO values (SEP-AUG); Source: NOAA

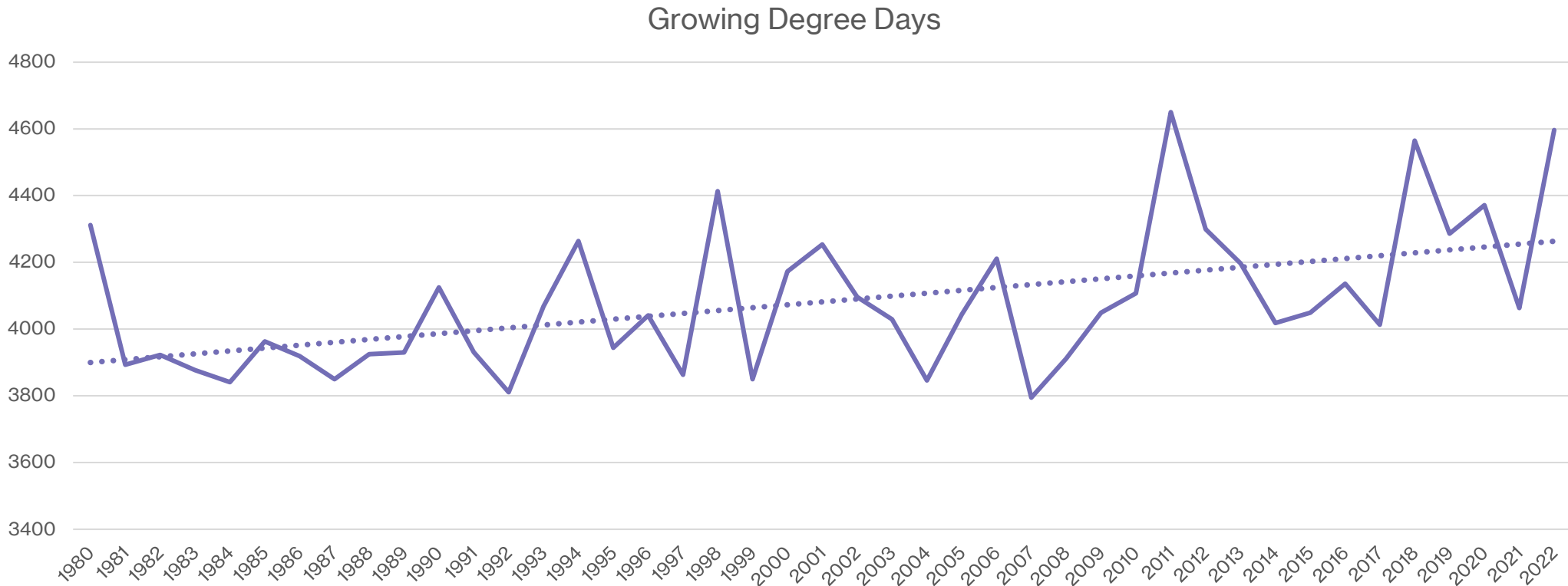# ENSO Values and Planted Cotton Acres

Abandonment vs. ENSO

Average Annual ENSO Value vs Texas Abandonment Rate; Source: USDA-NASS, NOAA

Other Factors
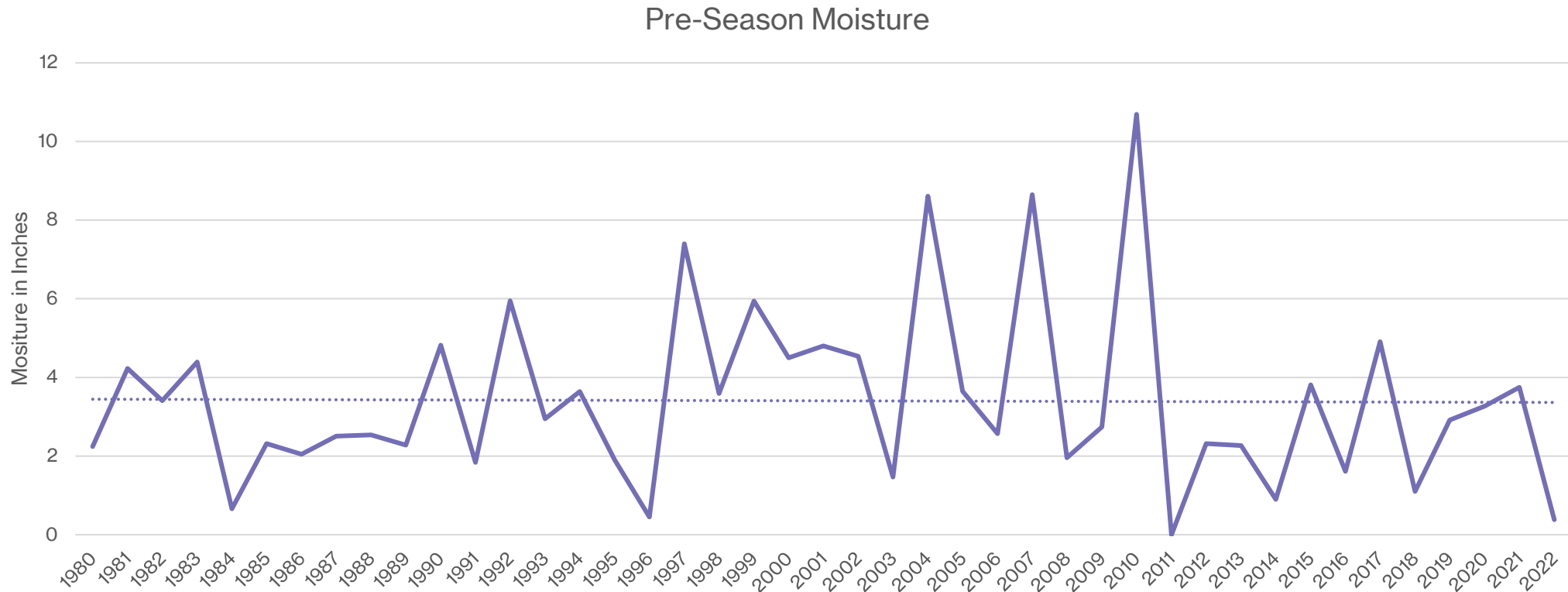
Pre-season (Sep-May) Moisture, High Plains Average; Source: NOAA

Other Factors

Growing Degree Days

Growing Degree Days (May-Sep), Lubbock, TX; Source: NWS

Other Factors

Proportion of TX Insured Acres
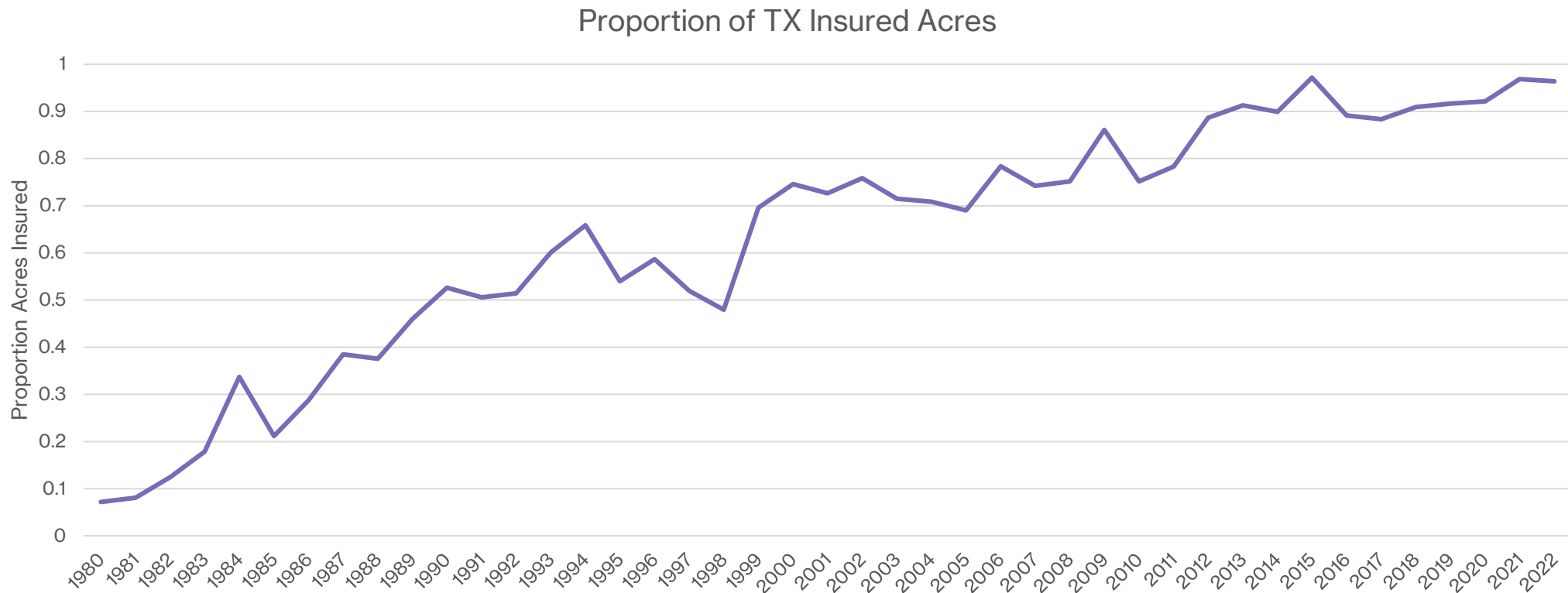
Proportion of Texas Cotton Acres Insured at 65% or higher (all types); Source: RMA

Other Factors

Cost of Production Share at Planting
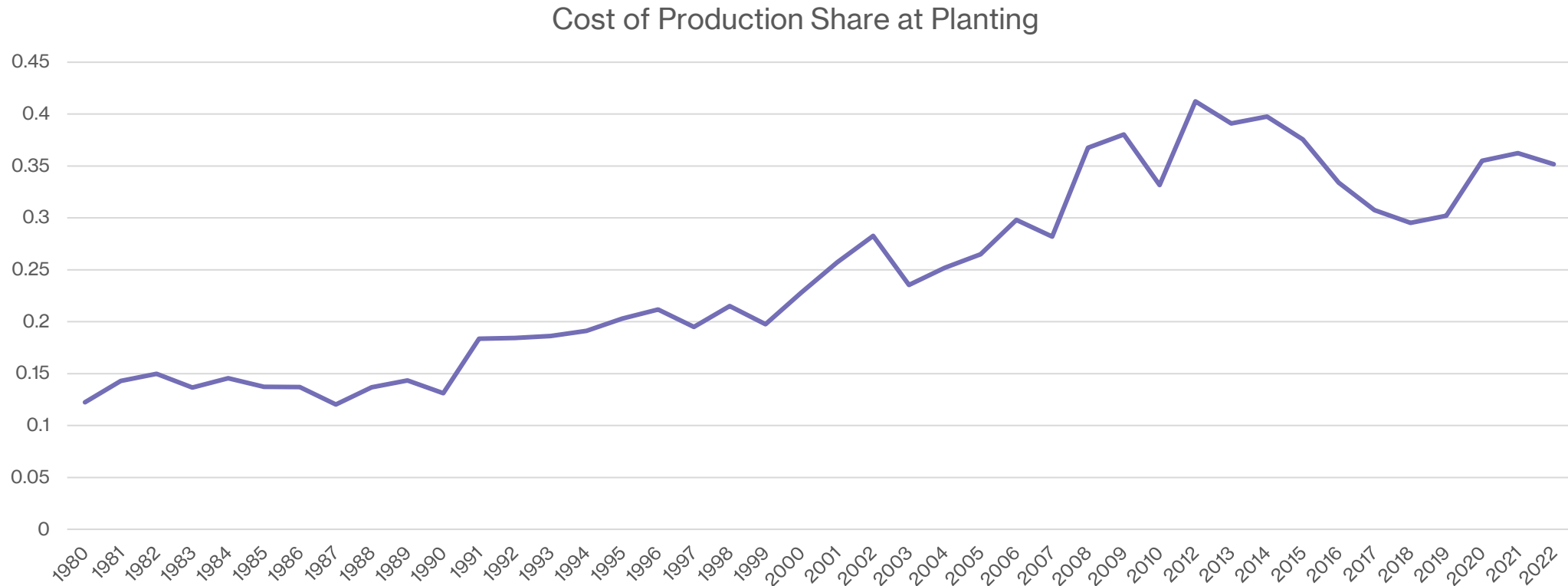
Share of Total Cost of Production at or before Planting, Prairie Gateway; USDA-ERS

Analysis

Table 2. Regression Results of Texas Cotton Abandonment Rate.

Variable	Coefficient	Standard Error	t-value	p-value
Intercept	12.609	6.103	2.066	0.047
ENSO	-0.053	0.027	-1.937	0.061
GDD	-0.006	0.003	-2.187	0.036
GDD^2	0.000	0.000	2.316	0.027
Insurance	0.339	0.187	1.815	0.079
Pre-Season Moisture	0.037	0.375	1.001	0.324
Farm Bill	0.779	0.955	0.812	0.422
Harvest Price	-0.169	0.163	-1.042	0.304
In*Pre	-0.075	0.052	-1.433	0.161
In*FB	-0.824	1.038	-0.794	0.432
F-value = 8.051, Adjusted R^2 = 0.602				

The Role of Moisture on Insurance

Predicted Abandonment vs. Total Insurance Effect (w w/o Pre-season Rainfall

● Pre-Season Rainfall   ● w/o Pre-Season Rainfall
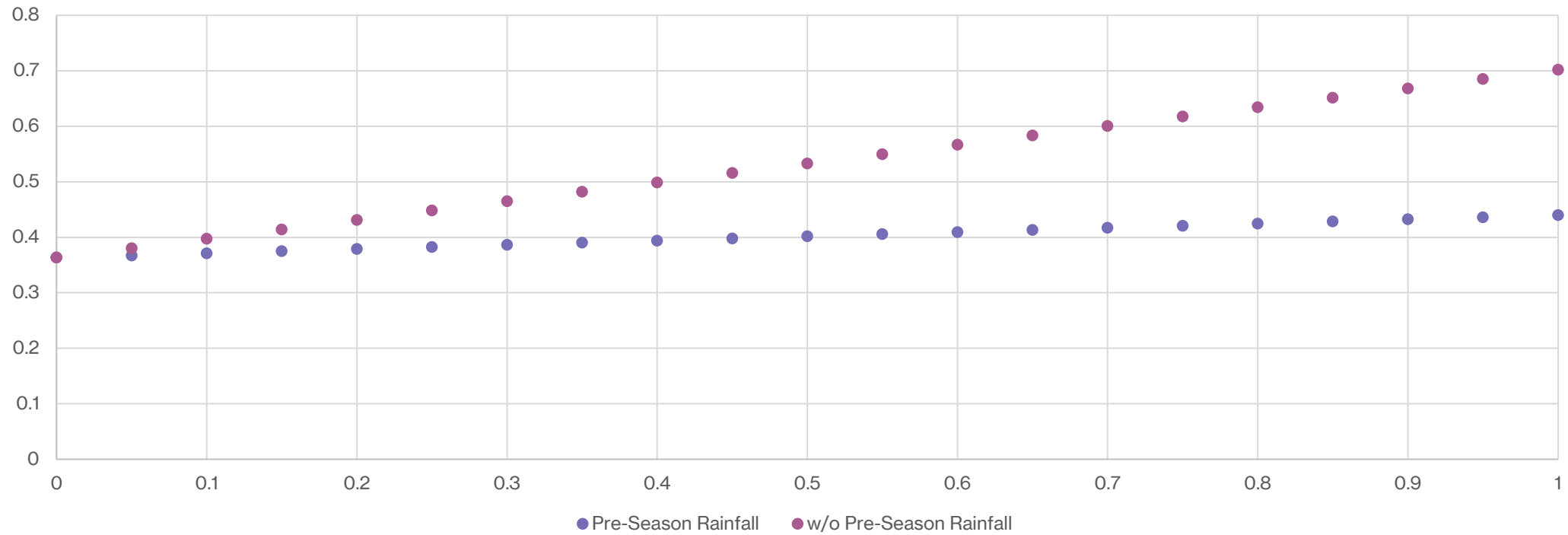
Discussion

- There is a significant upward trend in abandonment in Texas over time.

  - Mean of 10% in 1980 to a mean of 34% in 2022

- Higher proportion of acres in TX means a higher US average abandonment, on average

- Slight downward trend in ENSO values (move towards more La Niña average ENSO)

  - Lower ENSO values are associated with higher abandonment

- Crop insurance matters…but maybe not as much as everyone thinks

  - With no pre-season moisture considered, impact of crop insurance is large

  - Considering average pre-season moisture, the impact of crop insurance is muted

Conclusions

- At the margin, crop insurance influences abandonment decisions
  - BUT, that relationship is complex
    - Insurance price
    - Pre-season and in-season moisture
    - Cost of production
- ENSO values are important
  - Reflect dominant weather patterns; suite of weather variables that will be impacted
- Predicting abandonment is difficult
  - Variance is greater in the La Niña phase than El Niño phase
- Harvested acres determine production in cotton, not planted. Understanding abandonment is critical to projections of cotton