



CASE STUDY | TEXAS ECONOMIC IMPACT ANALYSIS

One Technology. One Investment.
Every Scenario Delivers Extraordinary Returns.

The Most Rigorous Economic Case Ever Made for WETA Ground-Based Ionization Precipitation Enhancement. And the Numbers Speak for Themselves.

Dr. Jason L. Johnson, Associate Professor & Extension Economist| Texas A&M University
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In water-stressed agricultural regions, producers face an impossible equation: how do you maintain productivity when nature provides less water each year? Traditional conservation measures can only stretch existing resources so far. But what if you could actually increase water supply and generate extraordinary economic returns in the process?

That's exactly what Dr. Jason Johnson has quantified in his March 2026 economic analysis of the Texas weather modification program, the most rigorous study of its kind ever applied to ground-based ionization technology. Unlike earlier analyses of traditional aircraft-based cloud seeding, this study was purpose-built for the WETA (Weather Enhancement Technology Array) investment model: a one-time capital cost delivering recurring annual benefits over the operational lifespan. Applying the 10-year discounted net present value methodology, the same standard used to evaluate major infrastructure investments, it produces Benefit-Cost Ratios (BCR) that are directly comparable to other capital decisions water managers and agricultural lenders face every day.

Three Scenarios

The analysis models outcomes across a realistic range of precipitation enhancement. Because benefits scale directly and proportionally with additional precipitation per Dr. Johnson's methodology, all three scenarios are fully defensible.

1-INCH CASE +1 Additional Inch of Rainfall

Annual statewide ag benefit: \$44.2M	Overall 10-year BCR: 5.66:1
Average statewide payback: 17 mo	Nine counties exceed 10-year BCR of 10:1

CONSERVATIVE CASE +10% Annual Precipitation (~1-3 in)

Annual statewide ag benefit: \$98.9M	Some counties pay back in under 3 months
Average statewide payback: 7.7 months	22 of 37 counties recover investment in under a year

UPSIDE CASE +20% Annual Precipitation (~2-6 in)

Annual statewide ag benefit: \$197.9M	All regions except Trans Pecos pay back under 1 year
Average statewide payback: 0.32 years	Fastest counties pay back in under 2 months

Why These Numbers Are a Floor, Not a Ceiling

Limited crops: Only four crops were analyzed. Hay, vegetables, pecans, and other high-value commodities were excluded.

10-year benefit window: Five latter years left uncounted by design.

Wheat response underestimated: Ground-based WETA operates year-round; winter precipitation benefits to wheat are not captured

No non-agricultural benefits: Municipal water, recreation, wildlife habitat, and fire suppression are not counted.

Continuous operation advantage: RAIN's 24/7 WETA ionization system delivers continuous enhancement versus aircraft's intermittent seeding.



10:1+

Nine Counties Exceed
This Return Over 10
Years

18.74:1

Highest 10-Year BCR
(Benefit-Cost Ratio)

3.9 Months

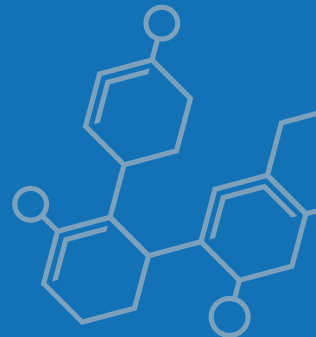
Avg. Statewide Payback
(Upside Case)

\$197.9M

Annual Statewide Ag
Benefit (Upside Case)

37 Counties

Across Five Texas WMA
Programs



Learn more at
rainenhancement.com

Economic Impact Breakdown

Dr. Johnson's analysis quantifies three distinct agricultural benefit streams from each additional inch of rainfall, using **2023–2025 USDA acreage data** and **2021–2024 commodity prices**, a significant upgrade from the decade-old figures used in earlier analyses. Together, these direct impacts total \$44.2M annually and **\$360.5M in discounted 10-year direct impact** across the 37-county study area.

Dryland Crop Revenue

\$27.1M

- 797,038+ acres of dryland corn, wheat, sorghum, and cotton
- Conservative yield increases per crop type
- Based on 4-year Olympic average commodity prices (2021–2024)

Irrigation Cost Savings

\$5.7M

- 597,246 certified irrigated acres across 37 counties
- 1 additional inch of rain = 1 fewer acre-inch of irrigation required
- Savings of \$6.75–\$15.00 per acre-inch (2025 AgriLife budgets)

Grazing Land Value

\$11.4M

- 13.8 million actively grazed pastureland acres
- Supports cattle, goat, and sheep operations across 37 counties
- 1 inch = 3.15–10.83% increase in annual precipitation

Economic Multiplier Effect

Agricultural dollars circulate through processing, transportation, equipment supply, and rural communities (IMPLAN analysis):

Crop multiplier: 2.02x

Cotton multiplier: 2.17x

Livestock multiplier: 2.25x

Result: Over \$86M annual statewide agricultural impact and \$700M in discounted 10-year statewide economic impact.

Regional Investment, BCR & Payback by Program

Investment requirements and returns vary by region, reflecting differences in agricultural intensity, crop mix, and baseline precipitation. The Rolling Plains region stands out with a 10-year BCR of 11.90:1 and average payback of 3.5 months under the upside case, driven by high concentrations of dryland farming in counties like Fisher, Jones, and Haskell, where individual 10-year BCRs reach 18.74:1.

	Investment	10-Year BCR	Payback (+10%)	Payback (+1 inch)
Panhandle (PGCD)	\$11.25M	5.87:1	0.62 yrs	1.39 yrs
Rolling Plains (RPWEP)	\$13.5M	11.90:1	0.29 yrs	0.69 yrs
Trans Pecos (TPWMA)	\$12.75M	1.96:1	3.53 yrs*	4.16 yrs
West Texas (WTWMA)	\$15.75M	3.97:1	1.05 yrs	2.05 yrs
South Texas (STWMA)	\$10.5M	4.41:1	0.67 yrs	1.85 yrs
All Texas WMAs (Combined)	\$63.75M	5.66:1	0.64 yrs	1.44 yrs

*Trans Pecos payback period reflects the region's lower agricultural intensity and limited dryland crop acreage. The region's primary benefit from additional precipitation accrues to grazing lands across its 3.5 million acres — a substantial long-term water resource value not fully captured in short-term payback calculations.

About Dr. Jason L. Johnson

Dr. Jason L. Johnson is an Associate Professor & Extension Economist at Texas A&M University and a fifth-generation rancher in Jacksboro, Texas. He authored the foundational 2014 benefit-cost framework for Texas weather modification programs and returned in 2026 to update and substantially improve that methodology specifically for ground-based WETA ionization technology. Dr. Johnson now serves as a key economic advisor to Rain Enhancement Technologies, providing water resource managers and institutional funders with the rigorous, applied economic framework needed to evaluate precipitation enhancement investments with confidence.



Source: Johnson, Jason L., 'A Benefit-Cost Analysis of a Potential Weather Modification Project that Produces One Additional Inch of Precipitation in Texas Rain Enhancement Project Counties.' Texas A&M University March 2026.