The FC Corn-Belt Drought Signal, Grade B Directional with Marginal Independent-Sample Significance

Why the USDM county Drought Severity and Coverage Index for Iowa, Illinois, and Nebraska z-scored on 5 years is a Grade B directional signal with marginal independent-sample significance on CME Feeder Cattle forward returns.

David Stendahl · Market Lab Analytics · November 1, 2026

The signal and why it matters today

The US Drought Monitor (USDM) publishes weekly Drought Severity and Coverage Index (DSCI) readings for every US county. For the three core corn-belt states – Iowa, Illinois, and Nebraska – DSCI captures the fraction of pasture, rangeland, and cropland area under drought stress on a 0-500 scale.

The empirical mechanism: when corn-belt DSCI runs high (drought firing), two cross-currents hit the feeder-cattle market. The longer-horizon corn-cost pass-through is bearish FC. The shorter-horizon forced-placement dynamic is bullish FC (drought in cow-calf country forces placement of lighter calves). The 60-day forward window captures the near-term forced-placement effect more than the longer corn pass-through.

Daily Spearman IC against FC fwd60d is plus 0.127 at p-value below 1e-24 across 6,691 trading days – strongly significant daily. Non-overlapping (every-60-day) IC is plus 0.143 at p-value 0.133 across 112 independent samples – MARGINAL (fails the standard 0.05 significance bar).

Phase +1 (Drought Firing) delivers plus 2.22 percent fwd60d (plus 0.62 pp above baseline, hit 61 percent). Phase –1 (Wet) delivers minus 0.12 percent (minus 1.73 pp below baseline, hit 49 percent).

Current reading: Wet extreme-negative firing at composite minus 0.838, 96 trading days running. Corn-belt DSCI is deeply below the 5-year baseline. Modest bearish-FC lean per the empirical direction.

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How the drought mechanism composes

The US Drought Monitor is the federal interagency drought intensity map published weekly by the National Drought Mitigation Center. The DSCI collapses the five drought-intensity classes (D0 Abnormally Dry, D1 Moderate, D2 Severe, D3 Extreme, D4 Exceptional) into a single 0-500 scale per county.

Drought Firing (positive composite, Phase +1) means USDM DSCI across the three corn-belt states is sustained above its 5-year baseline. The mechanism works through two cross-currents:

- Near-term 0 to 60 days: forced placement of lighter calves into feedlots as cow-calf operators cannot sustain summer grazing. Near-term feeder supply tightens.
- Longer-horizon 90 to 180 days: corn rally from reduced carryout compresses feedlot margins and pushes feeder bids down.

Over the 60-day forward window the near-term forced-placement effect dominates: Phase +1 delivers plus 0.62 pp above baseline, hit 61 percent.

Wet (negative composite, Phase −1) means USDM DSCI is sustained below the 5-year baseline. Wet conditions suggest firm fall grazing (ranchers hold cattle on pasture longer) and strong corn carryout. Near-term feeder supply is lighter as placements delay.

Historical pattern: Phase −1 delivers minus 1.73 pp below baseline, hit 49 percent.

Normal regime (Phase 0) is the equilibrium zone.

The signal is complementary to the FC Northern SNOTEL SWE signal. SNOTEL reads Mountain-West winter snowpack; this signal reads corn-belt pasture-and-crop drought directly.

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What the state-conditional returns have actually done

> **Reference baseline – FC fwd60d (unconditional)**
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> CME Feeder Cattle forward-60-day return baseline over the live-signal window: mean plus 1.60 percent, median plus 1.95 percent, standard deviation 7.4 percent, percent negative 40 percent. Sample window 2000-01-04 through 2026-10-30, 6,691 trading days with observable fwd60d.

Per-day sampling (used for daily Spearman IC):

Phase plus 1 (Drought Firing, composite greater than plus 0.3) covers 2,611 trading days – 39.0 percent of the sample. Per-day mean fwd60d plus 2.22 percent, hit rate 61 percent. OUTPERFORMS baseline by plus 0.62 pp.

Phase 0 (Normal) covers 1,092 trading days – 16.3 percent of the sample. Per-day mean fwd60d plus 4.85 percent.

Phase minus 1 (Wet, composite less than minus 0.3) covers 2,988 trading days – 44.7 percent of the sample. Per-day mean fwd60d minus 0.12 percent, hit rate 49 percent. UNDERPERFORMS baseline by minus 1.73 pp.

Asymmetric directional pattern: Phase +1 bullish, Phase −1 bearish, 2.35 pp directional spread.

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Three cases that frame how to read this signal

Case 1: Q3 2012. Drought Firing – historic Midwest drought.

Firing date: July 15, 2012 at composite near plus 0.90. Context: The 2012 Midwest drought was the most severe since 1988. USDM county DSCI across IA+IL+NE ran saturated. Forced placement of lighter calves triggered. Feeder cattle at approximately 140 dollars. Forward FC rallied through Q3-Q4 2012. Canonical Drought bullish-FC anchor.

Case 2: Q3 2021. Drought Firing – western drought corn-belt spillover.

Firing date: August 15, 2021 at composite near plus 0.70. Context: Severe western drought spilled into corn belt. USDM DSCI rose across IA+IL+NE. Feeder cattle at approximately 160 dollars. Forward FC rallied modestly through Q4 2021.

Case 3: Current Q4 2026. Wet extreme-negative firing.

Context: USDM county DSCI across IA+IL+NE is deeply below the 5-year baseline, 96 trading days running. Wet corn-belt conditions. CME Feeder Cattle trades the 330 to 340 dollar range. Historical Phase –1 delivers minus 1.73 pp below baseline – modest bearish lean.

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How to use the signal today

As of November 1, 2026, the composite reads minus 0.838 – Wet extreme-negative firing, 96 trading days running. USDM county DSCI across IA+IL+NE is deeply below the 5-year baseline. CME Feeder Cattle trades the 330 to 340 dollar range.

Historical Phase –1 per-day delivers minus 1.73 pp below baseline (49 percent hit rate). Modest bearish-FC lean. But non-overlap significance is MARGINAL (p=0.133) – treat as supportive-but-not-standalone evidence.

Pair with four confirming reads for direction:

- **FC US Herd Inventory Signal**. Strongest-IC structural supply anchor.
- **FC Northern SNOTEL SWE Signal**. Mountain-West water-supply cousin.
- **FC Feedlot THI Stress Signal**. Heat-stress feedlot margin.
- **FC TX Panhandle Polar Vortex Event Signal**. Winter weather event-detector.

Corn-belt drought is one of four weather-related FC signals. When drought firing aligns with heat stress and tight herd inventory, bullish-FC conviction is high.

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Methodology notes

Data source. US Drought Monitor (USDM) county DSCI daily readings for Iowa (FIPS 19), Illinois (FIPS 17), and Nebraska (FIPS 31). Published weekly by the National Drought Mitigation Center, ffilled to daily. Live window begins 2000-01-04.

Signal construction. Composite = DSCI averaged across all counties in IA+IL+NE, z-scored on 5-year (1,260-day) rolling window with 252-day minimum sample, clipped to [−3, +3], tanh-bounded to [−1, +1]. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1

at composite above +0.3, phase −1 below −0.3. Target: CME Feeder Cattle back-adjusted continuous (FC_110ARD).

Validation statistics. Daily Spearman IC against FC fwd60d is plus 0.127 at p-value below 1e-24 across 6,691 observations – strongly significant daily. Phase +1 per-day mean fwd60d plus 2.22 percent (plus 0.62 pp above plus 1.60 percent baseline, hit 61 percent). Phase −1 per-day mean minus 0.12 percent (minus 1.73 pp below baseline, hit 49 percent).

Independence test. Non-overlapping (every-60d) sampling yields Spearman IC plus 0.143 at p-value 0.133 across 112 independent observations – MARGINAL. The standard significance threshold is 0.05.

Why Grade B. Signals in this library are graded on dual significance. Z6635 passes daily IC strongly (p less than 1e-24) but fails the non-overlap threshold (p equals 0.133). Grade B signals pass daily but fail non-overlap and are published with explicit disclosure.

Reformulation note. The prior engine used NCLIMDIV monthly PMDI step-function + 8-month Jul/Aug season mask that inflated daily IC via autocorrelation (non-overlap p=0.231 FAIL). The reformulation replaces monthly PMDI with daily USDM DSCI, removes the season mask, and uses a 5-year z-window. Moved non-overlap from p=0.231 to p=0.133 (improved but still marginal).

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What this signal does not cover

First, MARGINAL non-overlap significance (p=0.133) means Grade B, not A/B+. Treat as supportive-but-not-standalone evidence.

Second, the engine captures the near-term forced-placement effect. The longer-horizon corn-cost pass-through is OPPOSITE sign (bearish FC) and shows up at 90-180 day horizons the 60-day forward window does not capture.

Third, USDM is weekly-release, ffilled to daily. The underlying data cadence is lower than the composite output appears.

Fourth, the IA+IL+NE geography captures the corn-belt feed-cost channel but misses the Southern Plains cow-calf country.

Broader caveat: Grade B directional corn-belt drought signal with marginal independent-sample significance. The signal provides a tactical lean on FC positioning. Pair with structural supply, weather, and margin signals for stacked confirmation.

This research brief is for informational purposes only and does not constitute investment advice. Past performance is not indicative of future results. Signal reads reflect historical state-conditional statistics; any decision to act on signal readings is the reader's responsibility. Data sources: US Drought Monitor (USDM) county DSCI for Iowa, Illinois, and Nebraska; CME Feeder Cattle back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.