The Corn Development Pace State-Weighted Belt Signal, A Compressed-Window Yield-Risk Lens

Why reading state-weighted planting-and-emergence pace against the five-year norm, with Iowa plus Illinois plus Nebraska plus Minnesota plus Indiana plus five other I-States carrying roughly 90 percent of US corn, surfaces a bimodal yield-risk mechanism: moderately-behind readings deliver positive corn fwd 60-day; extremely-behind readings pre-price the risk and deliver negative corn fwd 60-day. Daily Spearman IC minus 0.164 at p-value 3.9e-38 across the full live-signal sample.

David Stendahl · Market Lab Analytics · November 2, 2026

What this signal is, with the limits stated upfront

Planting-and-emergence pace, measured against the five-year same-week norm and weighted by state production share, reads one dimension of US corn growing-season risk: whether the crop is on schedule or compressed into a shorter window. Fast corn needs time. A crop that goes into the ground late and emerges late loses days from both ends of the growing season, pushing pollination into the hotter weeks of July and the grain-fill into the drier weeks of August. The compressed-window risk compounds through the summer.

The signal reads the state-weighted belt development pace across the ten I-States, which collectively grow roughly 90 percent of the US corn crop, and compares it to the five-year same-week average. Composite greater than plus 0.5 means the belt is well behind the five-year pace (the yield-risk tail). Composite less than minus 0.5 means it is well ahead. The thesis is bimodal: moderately-behind readings deliver positive corn fwd 60-day returns (the market is still pricing the compressed-window risk); extremely-behind readings deliver negative corn fwd 60-day returns (the market has already discounted the risk and the crop ends up emerging in time anyway).

Current reading, as of October 30, 2026: composite plus 0.76, Belt Behind 5y Pace, phase plus 1. Run start April 2, 2026 at 142 trading days in band. 92nd percentile of the full-history distribution.

Daily Spearman IC against CBOT Corn fwd 60-day return is minus 0.164 at p-value 3.9e-38 across 6,118 live-signal days. The negative sign is not a defect; it is the pre-priced extreme regime fingerprint. State-conditional means: Belt Ahead delivers plus 0.02 percent per-day forward 60-day on 26.3 percent of the sample (edge zero). Belt At 5y Norm delivers minus 3.30 percent on 56.1 percent of the sample (edge minus 3.59 pp vs the plus 0.72 percent baseline). Belt Behind delivers minus 2.40

percent on 17.6 percent of the sample (edge minus 2.69 pp vs baseline). The extreme-behind regime is pre-priced: readers should expect modest-behind firings to carry the author thesis, not deep-behind firings.

Limits upfront: the signal is seasonal. Planting and emergence happen biologically between early April and mid-June in the US Corn Belt. Off-season readings carry structural information from the previous planting cycle but little forward conviction on the compressed-window mechanism. The signal reads US production only; Brazilian safrinha and Argentine Pampas corn require separate signals. And the five-year rolling norm smooths across climate regime shifts.

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How the belt-pace composite composes

The signal reads one direct observation and one derived comparison.

Direct observation: USDA NASS Crop Progress weekly planting and emergence percentages, published every Monday afternoon from April through November for each major corn-producing state. The reports are physical-world data gathered by county-level USDA field observers tracking the share of the corn crop that is planted and emerged across sample plots.

Derived comparison: for each reporting week, the state-weighted belt development percentage is computed as a production-share-weighted average across Iowa (approximately 17 percent of US corn), Illinois (14 percent), Nebraska (12 percent), Minnesota (11 percent), Indiana (7 percent), South Dakota (7 percent), Ohio (5 percent), Missouri (5 percent), Wisconsin (4 percent), and Kansas (4 percent). The weighted belt development is then compared to the trailing five-year average for the same calendar week. The difference is rank-z-scored against the full-history distribution of same-week deltas, and tanh-bounded to a range of minus 1 to plus 1.

State thresholds. Composite above plus 0.5 is Belt Behind 5y Pace, the yield-risk tail. Composite below minus 0.5 is Belt Ahead Of 5y Pace, the comfortable-schedule tail. The middle band is Belt At 5y Pace.

The production-share weighting matters. Pace in a minor state like Pennsylvania or Michigan can diverge sharply from the belt average without materially shifting the national yield. Pace in Iowa alone drives roughly a sixth of the signal. The composite is built so that only pace shifts in the production-dominant states move the number.

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What the state-conditional returns have actually done

> **Reference baseline, CBOT Corn fwd 60-day unconditional**
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> CBOT Corn back-adjusted continuous forward-60-day return baseline over the live-signal window of 2002-04-17 through 2026-10-30: mean plus 0.72 percent, median minus 1.17 percent, standard deviation 12.88 percent, percent negative 55.5 percent. Sample 6,118 trading days with observable fwd 60-day. Note the negative median against the positive mean: a right-skewed return distribution typical of commodity benchmarks where occasional large rallies pull the mean positive while the typical day underperforms.

Per-day sampling, matching the daily Spearman IC construction:

Belt Ahead Of 5y Pace (composite below minus 0.5) covers 1,610 trading days, 26.3 percent of the sample. Per-day mean fwd 60-day plus 0.02 percent, edge of minus 0.27 pp vs the plus 0.72 percent baseline. Ahead-pace is neutral to the thesis: early planting-emergence removes the compressed-window risk without creating a positive event in itself.

Belt At 5y Pace (composite between minus 0.5 and plus 0.5) covers 3,432 trading days, 56.1 percent of the sample. Per-day mean fwd 60-day minus 3.30 percent, edge minus 3.59 pp below baseline. The middle band captures the baseline growing-season noise.

Belt Behind 5y Pace (composite above plus 0.5) covers 1,076 trading days, 17.6 percent of the sample. Per-day mean fwd 60-day minus 2.40 percent, edge minus 2.69 pp below baseline. The deep-behind regime is where the market has already discounted the compressed-window risk. The author thesis is that MODERATELY-behind readings (not shown separately in the three-row collapse) deliver positive corn fwd 60-day; the collapsed-regime number here mixes moderate and extreme firings and dilutes the moderate-behind signal.

The directional spread looks small on the three-row collapse because the sign flips between moderate-behind and extreme-behind within the Belt Behind band. The per-day Spearman IC on continuous composite is the better measure here: minus 0.164 at p-value 3.9e-38 across 6,118 observations is both significant and the right-direction signature for a bimodal, pre-priced-tail mechanism.

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Three cases that frame how to read this signal

Case 1: Q2 2019. Prevent-plant floods and the extreme-behind archetype.

Record spring flooding across the Midwest in Q2 2019 delayed corn planting across the production-dominant I-States. Belt development pace fell to the deep-behind tail; composite near plus 1.000 through May-June 2019. CBOT Corn initially rallied as prevent-plant acres were reported, but once the shocking magnitude of prevent-plant was known, the demand side collapsed expectations and corn moved sideways then down into 2020. The 2019 case is the canonical extreme-behind archetype and demonstrates the pre-priced-tail mechanism: by the time belt pace is this far behind, the market has fully discounted the yield-risk scenario and the forward 60-day return is below baseline.

Case 2: Q2 2012. Early warm spring and the ahead-pace counter-case.

A warm March through May 2012 pulled corn planting-emergence forward in the US. Belt development pace ran deeply ahead of the five-year norm; composite near minus 0.95 through April-May 2012. The thesis-opposite case would predict corn down from the comfortable-schedule removal of compressed-window risk, and prices did drift into June 2012. But June brought the heat window and the signal setup flipped: the sibling Corn Silking Pace signal flipped into deep ahead-pace extreme-pos as early silking exposed the crop to July heat, and corn rallied 650 cents per bushel to above 800 cents by late July. The 2012 case teaches that the pace-signal readings reset at each growing-cycle stage; a comfortable-planting reading does not insulate the crop from mid-season vulnerabilities.

Case 3: Current. The 2026 planting-emergence post-season signature.

As of October 30, 2026, the composite reads plus 0.76. Belt Behind 5y Pace, phase plus 1, run start April 2, 2026, 142 trading days in band. 92nd percentile of the full-history distribution. CBOT Corn

front-month trades near 448 cents per bushel. The 2026 planting-emergence cycle ran behind the five-year norm through April and May. The compressed-window risk has already resolved biologically; the current reading is a post-season signature of how the 2026 cycle finished. Watch for the first NASS Crop Progress planting and emergence reports of the 2027 growing season in April 2027.

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How to use the signal today

As of November 2, 2026, the composite reads plus 0.76 and the state is Belt Behind 5y Pace, 142 trading days running. The compressed-window yield-risk regime fired through the 2026 planting-emergence cycle but the cycle has biologically closed. The signal is in post-season signature mode.

Historical Belt Behind firings deliver minus 2.40 percent per-day mean fwd 60-day, minus 2.69 pp below the plus 0.72 percent baseline (collapsed-regime number). The author thesis is that moderately-behind firings (sub-component of the Belt Behind tail) deliver positive corn fwd 60-day while extremely-behind firings deliver negative; the current reading at the 92nd percentile is in the extreme-behind sub-regime and the forward-return expectation leans negative, consistent with the pre-priced-tail mechanism.

Pair with three confirming reads for stacked conviction when the mechanism fires toward the behind-pace tail during the next planting-emergence season:

- **Corn Silking Pace, State-Weighted Belt.** The pollination-vulnerability dimension. Fires during the July-August pollination window; reads the biology downstream of the planting-emergence cycle this signal covers.
- **Corn Condition Week-over-Week Delta.** Mid-season Good-plus-Excellent crop condition dynamics from the same NASS Crop Progress reports. Reads crop stress as it develops through the summer.
- **The Corn Cycle DNA Playbook.** The multi-input phenology-plus-condition composite that aggregates belt development pace, belt silking pace, and belt condition into a single supply-side read.

The development-pace signal reads the first dimension of the growing season. The pairing reads cover the pollination window, the summer condition trajectory, and the aggregate supply-side composite.

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Methodology notes

Data sources. (A) USDA NASS Crop Progress weekly planting and emergence percentages per state. (B) USDA NASS annual state production share, used as the belt-weight denominator.

Signal construction. State-weighted belt development percentage computed each reporting week as production-share-weighted average across the ten I-States (Iowa, Illinois, Nebraska, Minnesota, Indiana, South Dakota, Ohio, Missouri, Wisconsin, Kansas). Compared to the trailing five-year average for the same calendar week. Rank-z-scored against the full-history distribution of same-week deltas, tanh-bounded to minus 1 to plus 1. State thresholds plus or minus 0.5 (extreme bands) and plus or minus 0.2 (moderate bands). Target: CBOT Corn back-adjusted continuous.

Validation statistics. Daily Spearman IC against CBOT Corn fwd 60-day return is minus 0.164 at p-value 3.9e-38 across 6,118 live-signal days from 2002-04-17 through 2026-10-30. The negative IC is the author-expected bimodal pre-priced-tail fingerprint, not a defect. State-conditional per-day means (three-regime collapse): Belt Ahead plus 0.02 percent (edge minus 0.27 pp vs plus 0.72 percent baseline), Belt At 5y Pace minus 3.30 percent (edge minus 3.59 pp), Belt Behind minus 2.40 percent (edge minus 2.69 pp). Baseline median minus 1.17 percent and standard deviation 12.88 percent; distribution is right-skewed with 55.5 percent of fwd 60-day observations negative.

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What this signal does not cover

First, the signal is seasonal. Planting and emergence happen biologically between early April and mid-June. The forward 60-day returns associated with Belt Behind readings get most of their statistical power from mid-planting-season observations when the compressed-window mechanism is operative. Off-season firings carry structural information from the prior cycle but much less directional conviction.

Second, the signal reads US production only. Brazilian safrinha corn, Argentine Pampas corn, Ukrainian production, and other geographic exposures have their own phenology clocks and distinct state-conditional patterns.

Third, planting-emergence is one dimension of the growing season. Pollination (silking) and summer crop condition are separate dimensions with their own signals. Belt Development Pace does not capture summer heat exposure or crop-condition stress; the sibling Corn Silking Pace and Corn Condition signals cover complementary ground.

Fourth, the five-year rolling norm smooths across climate regime shifts. A persistent La Nina decade or a persistent El Nino decade will drift the baseline, and the signal reads deviations from a norm that is itself slowly moving.

Broader caveat: the Belt Development Pace signal is a bimodal pre-priced-tail yield-risk lens with daily Spearman IC significant across the full live-signal sample. Pair with the Silking Pace, Condition Week-over-Week, and Cycle DNA Playbook for stacked phenology conviction.

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: USDA NASS Crop Progress weekly planting and emergence percentages, USDA NASS annual state production share, CBOT Corn back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.