The Corn Silking Pace State-Weighted Belt Signal, Phenology As Pollination-Vulnerability Lens

Why reading state-weighted belt silking pace against the five-year norm, with Iowa plus Illinois plus Nebraska plus Minnesota plus Indiana carrying roughly 65 percent of US corn, surfaces one of the few state-conditional edges in corn where the ahead-pace tail delivers plus 3.26 percent fwd 60-day against a plus 0.63 percent baseline, with Spearman IC plus 0.0896 at p-value 9.4e-13 across the full live-signal sample.

David Stendahl · Market Lab Analytics · November 2, 2026

What this signal is, with the limits stated upfront

Belt silking pace, measured against the five-year same-week norm and weighted by state production share, reads one specific vulnerability window in the US corn growing cycle. Silking is the moment pollen leaves the tassel and reaches the silk; it is the single most heat-sensitive and moisture-sensitive point in the corn plant's life. If belt-wide silking arrives earlier than usual, pollination is pulled into the hottest and driest part of July. If it arrives late, pollination lands past the critical window with more moisture in the field and the vulnerability has already passed.

The signal reads the state-weighted average silking percentage across the five I-States, which together grow roughly 65 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 ahead of the five-year pace. Composite less than minus 0.5 means it is well behind. The ahead-pace tail is where the author thesis lives.

Current reading, as of October 30, 2026: composite plus 0.53, Belt Silking Ahead Of 5y Norm, phase plus 1. Run start August 24, 2026 at 44 trading days in band. The eighty-ninth percentile of the full-history distribution.

Daily Spearman IC against CBOT Corn fwd 60-day return is plus 0.0896 at p-value 9.4e-13 across 6,318 live-signal days, significant across the full sample. State-conditional edges are cleanly monotone: Belt Silking Ahead delivers plus 3.26 percent per-day forward 60-day on 20.6 percent of the sample. Belt Silking At 5y Norm delivers minus 0.44 percent on 58.5 percent of the sample. Belt Silking Behind delivers plus 0.61 percent on 20.9 percent of the sample. The ahead-pace tail is the only state with a meaningfully positive edge against the plus 0.63 percent corn fwd 60-day baseline.

Limits upfront: the signal is seasonal. Silking happens in July and August. Off-season readings carry structural information from the previous growing season but little forward conviction. The signal reads US production only; Brazilian safrinha and Argentine Pampas corn require separate signals. And the five-year rolling norm smooths across multi-year climate regime shifts, so a persistent La Nina or persistent El Nino decade will drift the baseline.

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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 silking percentage, published every Monday from May through November for each major corn-producing state. The reports are physical-world data gathered by county-level USDA field observers walking through corn fields and counting silk emergence across sample plots.

Derived comparison: for each reporting week, the state-weighted belt silking 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), and Indiana (7 percent). The weighted belt percentage 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 Silking Ahead Of 5y Norm, the ahead-pace tail. Composite below minus 0.5 is Belt Silking Behind 5y Norm, the behind-pace tail. The middle band is Belt Silking At 5y Norm.

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 2001-06-26 through 2026-10-30: mean plus 0.63 percent, median minus 1.31 percent, standard deviation 12.69 percent, percent negative 56.6 percent. Sample 6,318 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 Silking Behind 5y Norm (composite below minus 0.5) covers 1,893 trading days, 20.9 percent of the sample. Per-day mean fwd 60-day plus 0.61 percent, edge of zero vs the plus 0.63 percent baseline.

Behind-pace is neutral to the thesis: late silking lands past the heat window with more moisture, so there is no systematic bias either direction.

Belt Silking At 5y Norm (composite between minus 0.5 and plus 0.5) covers 5,290 trading days, 58.5 percent of the sample. Per-day mean fwd 60-day minus 0.44 percent, edge minus 1.07 pp below baseline. The middle band is where corn trades the growing season's noise.

Belt Silking Ahead Of 5y Norm (composite above plus 0.5) covers 1,856 trading days, 20.6 percent of the sample. Per-day mean fwd 60-day plus 3.26 percent, edge plus 2.63 pp above baseline. The ahead-pace tail is the pollination-vulnerability regime: early silking means pollination landed in the July heat window, and historically that has driven yield reductions and corn-price rallies.

The directional spread is 3.70 pp from the At-norm band to the Ahead-pace tail. Not as wide as the drought-composite signals, but monotone in the thesis direction with daily IC significance across six-plus thousand observations.

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Three cases that frame how to read this signal

Case 1: July 2012. The drought-era ahead-pace archetype.

The 2012 US corn crop was pulled forward by an unusually warm March through May across the Corn Belt. By July 15, the state-weighted belt silking percentage reached approximately 70 percent against a five-year average of 45 percent, placing the signal deep in the ahead-pace tail. The empirical thesis delivered emphatically. Early belt silking exposed the production-dominant crop to the peak heat window of July 20 through 27, when temperatures ran above 100 degrees Fahrenheit across the central Corn Belt. Yields collapsed. Corn front-month rallied from 650 cents per bushel on June 15 to above 800 cents by late July. The 2012 case is the canonical ahead-pace archetype and defines the state-conditional mean.

Case 2: Q2 2019. Prevent-Plant floods and the behind-pace counter-case.

Record spring flooding across the Midwest in Q2 2019 delayed corn planting and pulled belt silking into the behind-pace tail. Composite ran near minus 0.70 through late June. The thesis-opposite case would predict corn down from avoided pollination stress, and prices did move sideways then down into 2020 as prevent-plant acres emerged and demand expectations collapsed. The 2019 case teaches that the behind-pace tail is not symmetric with the ahead-pace tail: late silking removes the vulnerability but does not create a positive event, and the demand-side acreage dynamics can dominate.

Case 3: Current. The ahead-pace reading at the 89th percentile.

As of October 30, 2026, the composite reads plus 0.53. Belt Silking Ahead Of 5y Norm, phase plus 1, run start August 24, 2026, 44 trading days in band. 89th percentile of the full-history distribution. CBOT Corn front-month trades near 448 cents per bushel. The critical July heat window has passed for the 2026 season, so the pollination-vulnerability window of this specific reading has already resolved. The current reading is the signal's post-season signature. Watch for the first silking reports of the 2027 growing season in June and July 2027 to see whether the ahead-pace pattern persists.

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How to use the signal today

As of November 2, 2026, the composite reads plus 0.53 and the state is Belt Silking Ahead Of 5y Norm, 44 trading days running. The pollination-vulnerability regime fired for the 2026 growing season but the heat window has passed. The signal is in post-season signature mode.

Historical Belt Silking Ahead firings deliver plus 3.26 percent per-day mean fwd 60-day, plus 2.63 pp above the plus 0.63 percent baseline. The current reading has already resolved for 2026 physical corn. Direction conviction for the next 60 days is lower than a mid-season Ahead reading would be.

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

- **Corn Development Pace, State-Weighted Belt.** The planting-and-emergence pace dimension. Methodologically similar z-score construction. Combined 30 percent weight on belt phenology in the Corn Cycle DNA playbook.
- **Corn Condition Week-over-Week Delta.** Mid-season Good-plus-Excellent crop condition dynamics from the same NASS Crop Progress reports.
- **The Corn Cycle DNA Playbook.** The multi-input phenology-plus-condition composite that aggregates belt silking, belt development pace, and belt condition into a single supply-side read.

The silking signal reads one specific vulnerability window. The pairing reads cover the planting-emergence setup, the mid-season condition trajectory, and the aggregate supply-side composite.

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Methodology notes

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

Signal construction. State-weighted belt silking percentage computed each reporting week as production-share-weighted average across Iowa, Illinois, Nebraska, Minnesota, and Indiana. 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 plus 0.0896 at p-value 9.4e-13 across 6,318 live-signal days from 2001-06-26 through 2026-10-30. State-conditional per-day means: Belt Silking Ahead plus 3.26 percent (plus 2.63 pp above plus 0.63 percent baseline), Belt Silking At plus 5y Norm minus 0.44 percent (minus 1.07 pp vs baseline), Belt Silking Behind plus 0.61 percent (edge zero). The ahead-pace tail is the one meaningful state-conditional edge. The baseline median is minus 1.31 percent and the standard deviation is 12.69 percent; the distribution is right-skewed with 56.6 percent of fwd 60-day observations negative.

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What this signal does not cover

First, the signal is seasonal. Silking happens in July and August. The forward 60-day returns associated with ahead-pace readings get most of their statistical power from mid-growing-season observations when the pollination mechanism is operative. Off-season firings carry structural information from the prior growing season 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. A reader focused on global corn balance needs multiple phenology lenses, not just this one.

Third, pace is one dimension of the growing season. Development stage and crop condition are separate dimensions with their own signals. The Belt Silking Pace signal does not capture how the corn plant is actually doing during pollination, only when it is pollinating. The condition and development-pace 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. In regime-change years the signal temporarily underperforms its historical state-conditional pattern.

Broader caveat: the Belt Silking Pace signal is a direct phenology lens with daily Spearman IC significant across the full live-signal sample and a 3.70 pp directional spread between the At-norm band and the Ahead-pace tail. Pair with the Development 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 silking percentage, USDA NASS annual state production share, CBOT Corn back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.