



 2026
AGRONOMY
INSIGHTS

Maizex 2026 Agronomy Insights

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About Maizex Seeds:

Maizex Seeds commercializes and markets high-performance corn hybrids, soybean varieties, forages, and seed-based technologies for Canadian farmers. Maizex, together with Sollio Agriculture as a joint venture launched in 2018, is owned and operated by Canadian farmers. Combined, the businesses have over 100 years of experience in building farmer trust through market-leading product performance and best-in-class agronomy and product support.

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2025 SEASONAL OVERVIEW

A Year to Remember for the Deep Southwest; a Year to Forget East of Highway 400

Planting and Spring 2025

What began as an early start to planting across Southern Ontario, marked by warm, dry conditions during the final week of April, quickly turned into one of the more challenging planting seasons in recent memory. As the calendar flipped to May, conditions shifted dramatically, bringing prolonged periods of cool temperatures, frequent rainfall, and limited sunlight.

A second planting window opened from May 10th to May 21st, allowing significant progress across much of the province. Crops planted during the April window began emerging during this period and, while stands were somewhat ragged and uneven, emergence generally reached around 90%. Soybeans planted in April took longer to emerge but ultimately achieved solid, uniform stands that supported yields. Corn fields planted between May 10th and May 15th benefited from a brief stretch of warm conditions in Southwestern Ontario, allowing emergence within 7–10 days just ahead of another extended period of cold, wet weather. Similarly, most soybeans planted during this window fared well and avoided significant issues.

Corn planted after May 15th struggled significantly, with emergence often delayed beyond two weeks and many fields only beginning to poke through the soil as the calendar turned to June. Soybeans planted later in that window, particularly closer to May 22nd/23rd, experienced declining populations, in some cases falling to unacceptable stand levels. This led to many replants well into June. Fields left at lower populations, often around 100,000–120,000 PPA, frequently showed slow, delayed growth for much of the season.

On May 22nd and 23rd, much of Ontario received a widespread cold rain event that proved especially challenging for crops planted in the days prior. Both corn and soybean fields were negatively impacted. Many soybean fields required replanting, and even corn was replanted on heavy clay soils where crusting and delayed

emergence were common. Numerous fields were rotary hoed, vertically tilled, or lightly replanted to break surface crusts, often resulting in uneven stands and below-average plant populations. Overall, May 2025 ranked among the coldest over the past decade, with temperatures consistently below seasonal norms and extended periods lacking both heat and sunlight.

By early June, many regions were already running approximately 100–150 crop heat units (CHUs) behind normal, setting the stage for a season focused on catching-up development. CHU accumulation throughout May averaged roughly:

- Southwestern Ontario: ~70–85% of normal
- Central/Western Ontario: ~65–80% of normal
- Eastern Ontario: ~55–70% of normal

These conditions collectively slowed emergence, reduced early vigor, and challenged stand establishment across both corn and soybean fields.

Growing Season Review

The 2025 growing season varied widely across Ontario. As reflected in the Agricorp maps shown on the following pages, rainfall distribution largely dictated crop performance. Fields west of Hwy 19 in Southern Ontario, and generally west of Listowel and Harriston, received sufficient rainfall to produce excellent crops. In contrast, counties such as Simcoe, Norfolk, Haldimand, and Niagara on the eastern side of Southern Ontario experienced below-average yields, aside from isolated pockets where timely thunderstorms benefited individual fields. While dry areas also existed in the west, the highest yielding regions overall included Chatham-Kent, Essex, Lambton, and Elgin counties.

Many of these counties produced corn yields that pushed into record territory. Fields exceeding 300 bu/ac were not



Field planted 10 days prior to a cold, saturating rain in Waterford, Ontario; May 22, 2025.



Crusted, rotary hoed corn in Haldimand County; June 2, 2025.

uncommon in 2025. The Maizex intensive trial in Ridgetown, Ontario, highlighted these exceptional conditions, with MZ 4703DBR reaching 321.3 bu/ac in one of the high-population treatments. Soybeans followed similar geographic trends in Southwestern Ontario; however, late-season rains generally favored corn more than soybeans. This made record soybean yields harder to find. Areas such as Niagara struggled with significantly poor early stands caused by crusting, and challenging early conditions limited yield potential. Soybean yields of 20–30 bu/ac were common in the driest pockets.

Central and Eastern Ontario faced some of the toughest conditions of the season. Central Ontario experienced what many considered one of the worst droughts in 25 years. Eastern Ontario also suffered severely, with many areas receiving only about ~48% of normal seasonal rainfall, much of it arriving either too early or too late to provide meaningful crop benefit. In these regions, some corn yields fell below 50 bu/ac, soybean yields dropped below 10 bu/ac, and certain fields were not harvested at all. A mid-September frost in Eastern Ontario further shortened the growing season, reducing yield potential and contributing to lower test weights in affected areas.

Ontario's summer also brought significant heat stress, recording 24 days above 30°C, the most since 2021, another challenging crop year. Equally concerning was the number of nights exceeding 21°C, as elevated nighttime temperatures can stress corn during pollination and grain-fill. While hot daytime temperatures can be tolerated, the absence of cooler nights places additional strain on crop development.

One phenomenon frequently discussed during the season was "tassel wrap," often associated with rapid late-season growth patterns sometimes referred to as rapid growth syndrome or "buggy whip." While tassel wrap created pollination challenges in parts of the Midwestern U.S., it was largely limited in Ontario. Tassel wrap occurs when the tassel fails to fully emerge from the whorl before pollen shed, potentially leading to poor synchronization between silk emergence and pollen release, resulting in incomplete pollination. It was most often observed on hybrids with smaller tassels or limited lateral branching traits commonly selected through breeding to improve drought tolerance and direct more energy toward ear development. In many cases, rapid growth following rainfall after extended dry periods likely contributed to plants elongating faster than the tassel could properly emerge, increasing the risk of this condition.

Yield Tour Review

As in previous years, the Great Ontario Yield Tour visited hundreds of fields across the province to estimate potential yields ahead of harvest. Once again, valuable data was gathered. Early observations suggested the Southwest had a solid crop, though visually it did not appear to be a record-breaker. That perception changed as the season progressed, with timely rainfall and favorable late-season conditions maximizing kernel weight and final yield. Fields in Southwestern Ontario recorded thousand kernel weights around or above 400 g/1000 kernels, translating to roughly 55,000–65,000 kernels per bushel.

Moving east across the province, conditions deteriorated quickly. In Central Ontario, it was evident that yield potential had largely been lost. Eastern Ontario still held a small glimmer of hope—if, and it was a big if, timely rainfall arrived. Unfortunately, that rain never came, and a mid-September frost brought the growing season to an abrupt end, further reducing both actual and projected yields. For the first time in Yield Tour history, we encountered both corn and soybean fields considered unlikely to be harvested, with projected yields below 10 bu/ac for corn and under 5 bu/ac for soybeans.

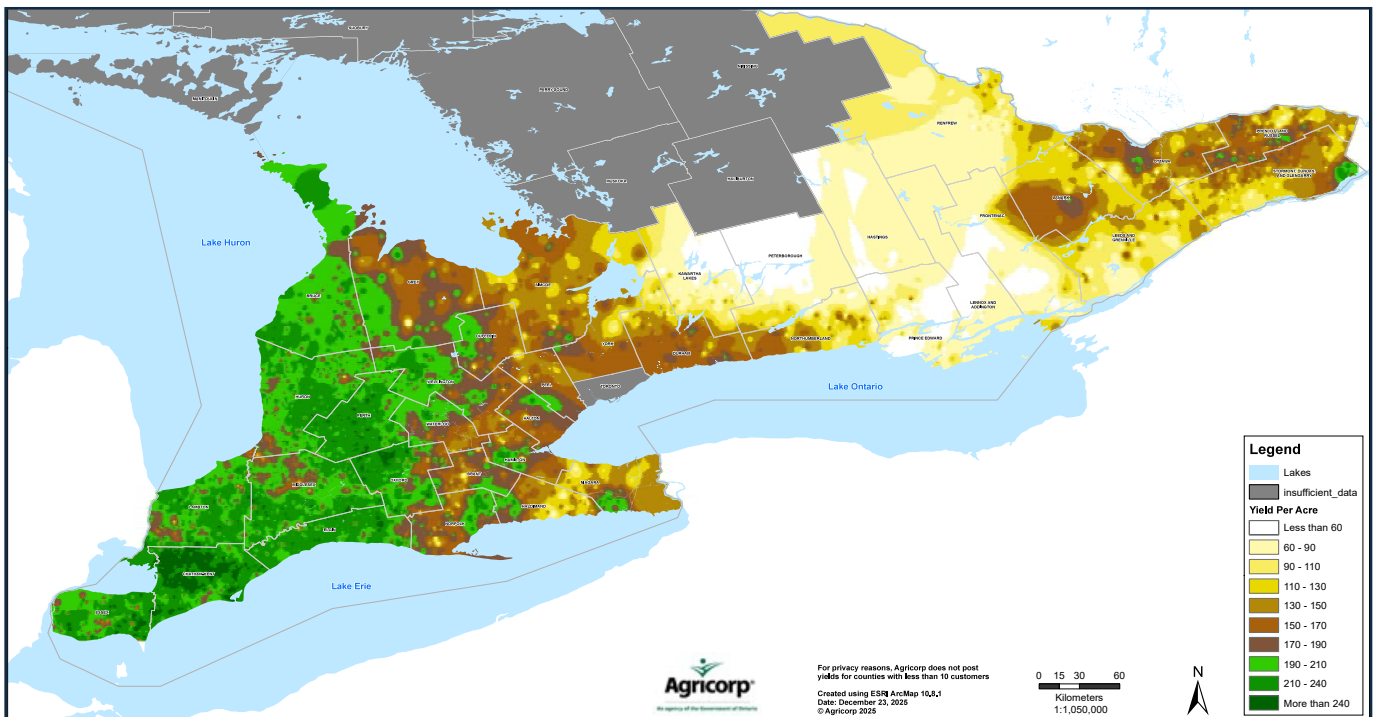
Yield components collected during the tour clearly reflected the challenging spring planting conditions and difficult May weather. Average corn populations declined to 29,257 plants per acre, down sharply from 30,391 PPA in 2023 and 30,768 PPA in 2024. The difficult start also showed up in ear

development. Kernel rows around declined to 16.8 despite lower populations, compared to 16.9 in 2024 and the record 17.1 observed in 2023. Kernel length was also reduced, with hot and dry mid-summer conditions, particularly elevated nighttime temperatures, contributing to kernel abortion and tip-back. Average kernel length measured 32.1, down from 33.9 in 2024 and 34.1 in 2023.

The combination of drought stress in Central and Eastern Ontario and declining yield components across the province led to a Yield Tour estimate of 178.93 bu/ac for corn. We maintained our divisor at 89,000 kernels per bushel, consistent with previous years. The final Agricorp reported yield came in at 191 bu/ac, approximately 12 bu/ac higher than our estimate and near the 10-year average. In hindsight, we likely underestimated kernel weight. Late-season rainfall in Southwestern Ontario, where a large portion of Ontario’s corn is produced, likely increased kernel weights beyond our assumptions. While our calculations are weighted by county production and local yield tour measurements such as population, kernel rows, and kernel length, kernel weight was held constant across all regions. Increasing expected kernel weight by approximately 5–6% and adjusting the divisor to roughly 83,000–84,000 kernels per bushel would have brought our estimate much closer to the final reported yield. Additionally, smaller or poorly pollinated ears often produce heavier kernels, including more large butt kernels and “bubble” kernels, which were commonly observed in some of the most drought-affected areas.

Corn: 2025 Production Insurance Reported Harvested Yields

Source: Agricorp. For full Ontario average yields, visit OMAFA’s website.





Tassel wrap in a Southwestern Ontario corn field; July 24, 2025.

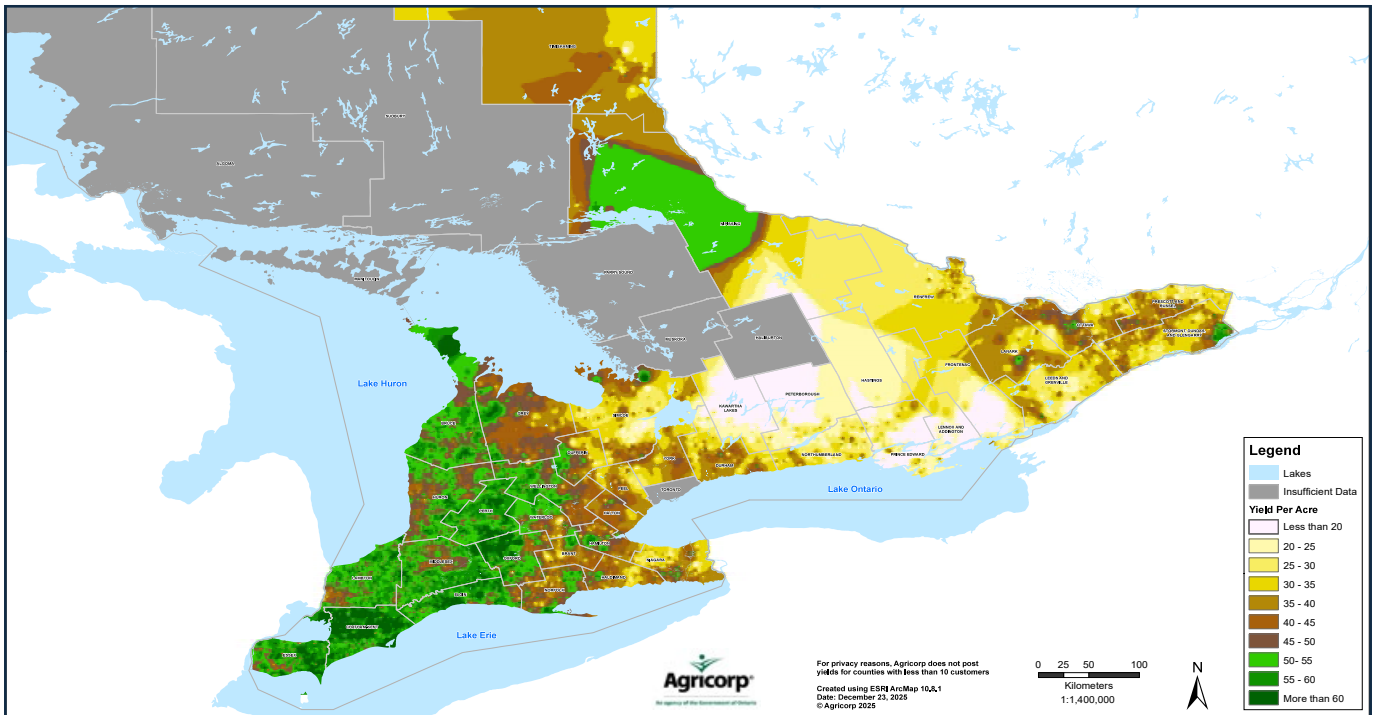


Poorly pollinated corn in Lucknow, Ontario; August 12, 2025.

Soybean data told a similar story. Average plant stands declined to 134,375 PPA, down from roughly 139,000 in 2023 and nearly 142,000 in 2024, again reflecting challenging planting and emergence conditions. Pod counts also fell significantly, averaging 32 pods per plant compared to record levels of 39 in 2024 and 38 in 2023. The combination of reduced stands and lower pod counts led to a predicted soybean yield of 46.61 bu/ac. This estimate proved highly accurate, aligning closely with the Agricorp reported provincial average of 46 bu/ac, approximately 6% below Ontario's 10-year average.

Soy: 2025 Harvested Yields

Source: Agricorp. For full Ontario average yields, visit [OMAFA's website](#).



Other Stories from 2025 and Planning for 2026

Several additional agronomic themes emerged throughout the 2025 growing season. With a warm, dry summer across much of Ontario, fungicide timing once again became a major point of discussion. Tar spot arrived later than in the previous two seasons, and in many cases fungicide responses returned to more traditional levels. Most of the province saw responses in the range of 7–12 bu/ac, a reminder that, while fungicides remain an important management tool in high-yielding corn systems, expectations must align with seasonal disease pressure.

Looking ahead, fungicide strategies may continue to evolve. In situations where DON risk from gibberella ear rot is minimal, later fungicide applications after VT–R1 in the R2–R3 window could provide additional flexibility and yield depending on disease development and environmental conditions.

Stand establishment was another major theme in 2025. Across much of the province, plant populations declined noticeably compared to recent seasons. While environmental stress played a large role, planting conditions, equipment setup, and management decisions also contributed. Understanding the difference between intended planting population, actual emergence, and final ear count will be critical moving into 2026. Population remains the simplest yield component to manage, and just because 34,000 seeds per acre were planted does not mean that population was achieved or maintained through harvest.

Finally, harvest proved challenging across much of the province, with many fields experiencing elevated grain moisture and slow dry-down. While summer heat unit accumulation was above average, which compensated to some extent for the cool May start, extended drought conditions and elevated nighttime temperatures likely contributed to periods of slowed growth or “drought dormancy.” Even as CHUs accumulated, crop development did not always progress as expected. Additionally, the absence of early frost and limited disease pressure, such as tar spot in the Southwest, delayed natural crop senescence and slowed drying, further complicating harvest operations.



Drought-stressed corn in Eastern Ontario; August 20, 2025.

Top of Mind for 2026

Planting populations vs. actual ear count:

Evaluate final ear counts in August and determine where plant loss occurred and why.

Fungicide remains a key tool:

A 7–12 bu/ac response in 2025 does not account for tar spot risk. Remember the potential for significant yield swings upwards of 100 bu/ac such as those observed in 2024 under high tar spot pressure.

Kernel weight continues to drive yield:

Even under stress, modern hybrids demonstrate strong resilience and can maintain yield through improved kernel fill.

Nitrogen efficiency will be critical:

With elevated urea and UAN prices, refining nitrogen management and working toward approximately 0.7 lbs N per bushel will be increasingly important.

Match populations to yield potential:

Population remains the most manageable yield component. Remember:

Yield = Population × Kernels per Ear × Kernel Weight

Maintain herbicide fundamentals:

Tight margins are not a reason to cut back on weed control. Strong early-season programs remain essential to protecting yield potential.

Acknowledgments:

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

What Winchester Trials Reveal About Modern Corn Hybrids

Background

Corn yield trends continue to move steadily upward. Approximately 75% of yield improvement can be attributed to breeding and biotechnology advancements, while the remaining 25% is driven by improved agronomic management. Genetic gains have come from several key areas, including increased stand densities, improved kernel mass, pest resistance through Bt technology, and enhanced tolerance to environmental stress.

According to USDA data, corn yields have shown remarkably consistent improvement over the past 80 years. Since the beginning of the hybrid era in 1946, yields have increased at an average rate of approximately 1.88 bu/ac per year. More recently, during the biotechnology era (1996–2023), yield gains have slightly exceeded this long-term trend, averaging roughly 1.9 bu/ac per year.

Ontario corn production has closely mirrored these trends and, in some cases, surpassed them. Over the past 42 years, Ontario corn yields have increased at a rate of just over 2.0 bu/ac per year, reflecting both genetic progress and strong agronomic adoption.

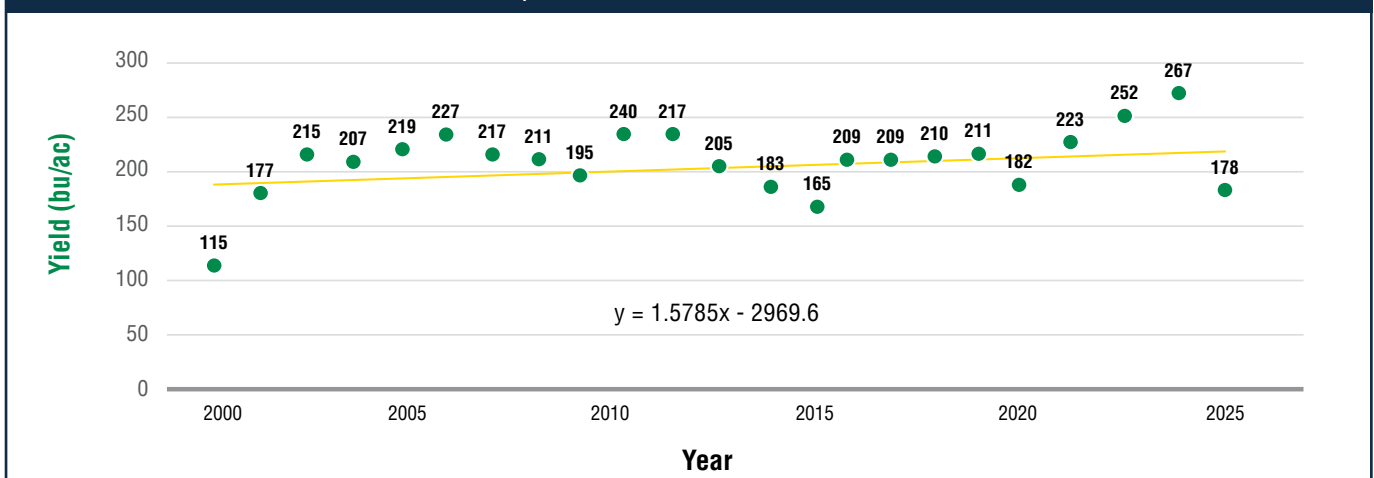
One of the most impactful breeding improvements has been the reduction of the anthesis–silking interval (ASI), which is the time between pollen shed and silk emergence.

This trait has been critical for stabilizing yield during stress conditions, particularly drought. Under moisture stress, pollen production and viability can be reduced, and older hybrids often shed pollen before silks were present, leading to poor kernel set.

Modern hybrids, by contrast, exhibit much tighter synchronization between pollen shed and silking. In many cases, silking now occurs simultaneously with, or even slightly before, pollen shed, greatly improving pollination success under stress. Additional genetic advancements, such as smaller tassel size, have further enhanced yield stability by reducing competition for resources and allowing the plant to better allocate energy toward ear development.

To better understand whether modern hybrids are truly more resilient than older genetics, Ontario Corn Committee (OCC) trial data can be used to compare historical results with those from recent stress years in Eastern Ontario. In 2025, Central and Eastern Ontario experienced one of the most severe droughts in recent memory, resulting in well-below-average yields. In some cases, farmers reported fields being disced down because harvest costs exceeded grain value. Across much of Eastern Ontario, crop insurance yields were reported at approximately 70–80% of the 10-year AFY (Average Farm Yield).

Graph 1: Winchester OCC Yield



Review of the Data

To avoid bias, one specific OCC trial location was selected: Winchester, Ontario. Yield data from the past 25 years were reviewed. Winchester is characterized by a silty clay loam soil with good moisture-holding capacity. Of the 25 seasons analyzed, 24 years had publishable data.

When examining *Graph 1*, the slope of the trendline is 1.58 bu/ac per year. This indicates that yield at this location has increased by 1.58 bu/ac annually. This is noticeably lower than the ~2.0 bu/ac per year increase observed across Ontario over the past 42 years.

The lowest yields at this location occurred in 2001, 2002, 2015, and 2025, all of which fell below the long-term trendline. Among these years, 2001 and 2025 represent the most negative deviations, while the most positive deviations occurred in 2010 (240 bu/ac) and 2024 (267 bu/ac).

In 2001, the trendline yield for Winchester was 188.97 bu/ac, while the actual yield was 115 bu/ac, representing 61% of

trendline yield. In 2025, the trendline yield was 226.9 bu/ac, while the actual yield was 178 bu/ac, representing 78% of trendline yield.

At first glance, this could suggest that the 2001 growing season was more stressful than 2025. However, a closer examination of seasonal rainfall data tells a different story.

All months in 2025 received less rainfall than in 2001, with the exception of May. Increased rainfall in May is not always advantageous, as firmer, drier soils often allow for improved planting conditions. September rainfall was also notably higher in 2001, coming in just 2 mm below the long-term average, while September 2025 was significantly drier.

Overall, the 2025 growing season received only 44.5% of normal rainfall, compared to 58% of normal rainfall in 2001, indicating that 2025 was the more severe drought year from a moisture standpoint.

Rainfall (mm) — Winchester, Ontario (May–September)

Year	May	June	July	August	September	Total
2001	46	61	37	25	84	253
2025	63	41	35	22	33	194
Historical Average	75	99	95	81	86	436



Drought-stressed corn in Eastern Ontario; August 19, 2025.



Severe drought conditions in Eastern Ontario; August 19, 2025.

Moving Forward and Conclusion

To further support the conclusion that modern hybrids are more resilient to stress than older genetics, a direct comparison between 2001 and 2025 is particularly illustrative. Despite lower overall rainfall in 2025 and a similar month-by-month rainfall distribution, yields at Winchester increased by 63 bu/ac over the 25-year period. This represents a 2.52 bu/ac per year gain, nearly 1 bu/ac per year greater than the site's long-term trendline of 1.58 bu/ac per year.

This divergence strongly suggests that modern corn genetics have substantially improved stress tolerance, allowing yields to deviate far less from trendline under adverse conditions than was observed with older hybrids. It also helps explain why Winchester has exhibited a lower overall yield increase (~1.58 bu/ac per year) compared to the provincial average of ~2.0 bu/ac per year.

Given high fertility and loamy soil at the Winchester location, the site represents a high-productivity, yield-stable environment where gains naturally occur more gradually. In contrast, more marginal areas across Ontario have likely realized faster yield improvements, as genetic advancements disproportionately benefit stress-prone environments, an effect clearly demonstrated by the comparative drought-year performance at Winchester in 2001 versus 2025.

When examining Maizex hybrids specifically, the improvement in both yield level and stability becomes clear. In 2001, the Maizex hybrid lineup averaged 94.71% of the

trial mean, or 108.9 bu/ac. In contrast, the 2025 Maizex portfolio averaged 100.67% of the trial mean, equating to 179.19 bu/ac, slightly above the overall trial average. This indicates that the work done by the Maizex corn product development team has resulted in significantly more stable hybrids than those available historically.

Equally notable is the reduction in yield variability among hybrids. In 2001, the highest yielding Maizex hybrid posted a 111 yield index, while the lowest was 78, representing a 33-point spread, or 37.95 bu/ac difference between the top- and bottom-performing hybrids.

By comparison, in 2025, the lowest-yielding Maizex hybrid recorded a 96 yield index, while the highest reached 106, resulting in just a 10-point spread, or 17.8 bu/ac difference in yield.

This clear tightening of yield variability demonstrates that modern hybrids, not only within Maizex but likely across the broader industry, have made substantial gains in yield stability and stress tolerance, even under challenging environmental conditions.

The yield gains, improved stability, and reduced variability observed in 2025 compared to 2001 demonstrate that modern corn breeding has moved beyond incremental yield improvement toward fundamentally greater resilience, enabling hybrids to perform more consistently across a wider range of stress environments.

Winchester 2001

Maizex Hybrid	Yield Index	Moisture
MZ276	78	19.7
MZ277	98	22.8
MZ278	83	22.7
MZ285	101	24.4
MZ281	90	22.3
MZ292	102	21.8
MZ288	111	21.9

Winchester 2025

Maizex Hybrid	Yield Index	Moisture
MZ 3006DBR	102	16.9
MZ 3117DBR	99	16.3
MZ 314	106	17.3
MZ 3314SMX	97	16.9
MZ 3432TRE	105	18.4
MZ 3505DBR	100	17.6
MZ 3704VT4	99	20.5
MZ 3717SSP	101	17.0
MZ 3930DBR	100	19.4
MZ 397	104	19.8
MZ 4026SSP	99	19.1
MZ 4049SMX	96	20.6

Acknowledgments:

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

INTENSIVE CORN MANAGEMENT:

Dialing in Population, Fungicide, and Nitrogen by Hybrid

Background

Maizex continues to invest time and research into increasing corn yield through intensive management trials aimed at better understanding hybrid performance. Intensive management differs from our flex work analysis on the grain produced in that it focuses specifically on hybrid response to fungicide and population, with a primary emphasis on yield and the economics of additional inputs.

Over the years, our intensive management approach has evolved. Previously, we evaluated additional nitrogen and fungicide as a full-package strategy. However, with changes in the disease spectrum across Ontario, specifically with the addition of tar spot, we have shifted to a more population-focused approach. This now includes a non-fungicide check while applying fungicide as the standard treatment across all other population levels.

The non-fungicide control allows us to gauge individual hybrid response to fungicide, while treating the remaining plots with fungicide reflects the broader-acre approach many growers are adopting for corn disease management in Ontario. Nitrogen rates were held constant at 200 lbs/ac in 2025.

The knowledge gained from intensive management trials can be used alongside flex data to further refine and dial in best management practices on a hybrid-by-hybrid basis to optimize yield.

How It Was Done

In 2025, five intensive management locations were established: Embro, ON; Inkerman, ON; St. Hyacinthe, QC; St. Célestin, QC; and Ridgetown, ON.

Due to later-than-ideal planting followed by severe drought and a mid-September frost in Eastern Ontario, the Inkerman location could not be harvested. As a result, Ontario data is limited to Embro and Ridgetown. The early frost also affected the Quebec locations; however, both St. Célestin and St. Hyacinthe were successfully harvested.

Treatments, Results & Discussion

EMBRO, ON

At Embro, treatments featured population adjustments only. The blocked no-fungicide check was discarded due to excessive in-field variability. All remaining treatments received fungicide and were randomized and uniformly applied:

- 26,000 PPA + Delaro Complete
- 34,000 PPA + Delaro Complete
- 38,000 PPA + Delaro Complete

Embro Results: Hybrid Response 'Buckets'

When assessing Embro results, hybrids naturally fell into three population-response categories.

1. High Flex / Flat Response Hybrids

MZ 3432TRE and MZ 4049SMX demonstrated significant flex potential. Classified as kernel number hybrids, these products showed a relatively flat yield response from 26,000 up to 38,000 PPA. Despite high overall yields, the environment was water-limited late in the season, and additional population provided little advantage.

2. Kernel Mass Hybrids – Parabolic Response

MZ 3314SMX and MZ 4026SSP, both classified as kernel mass hybrids, exhibited the classic parabolic population response. Yields increased significantly when moving from 26,000 to 34,000 PPA but declined at 38,000 PPA.

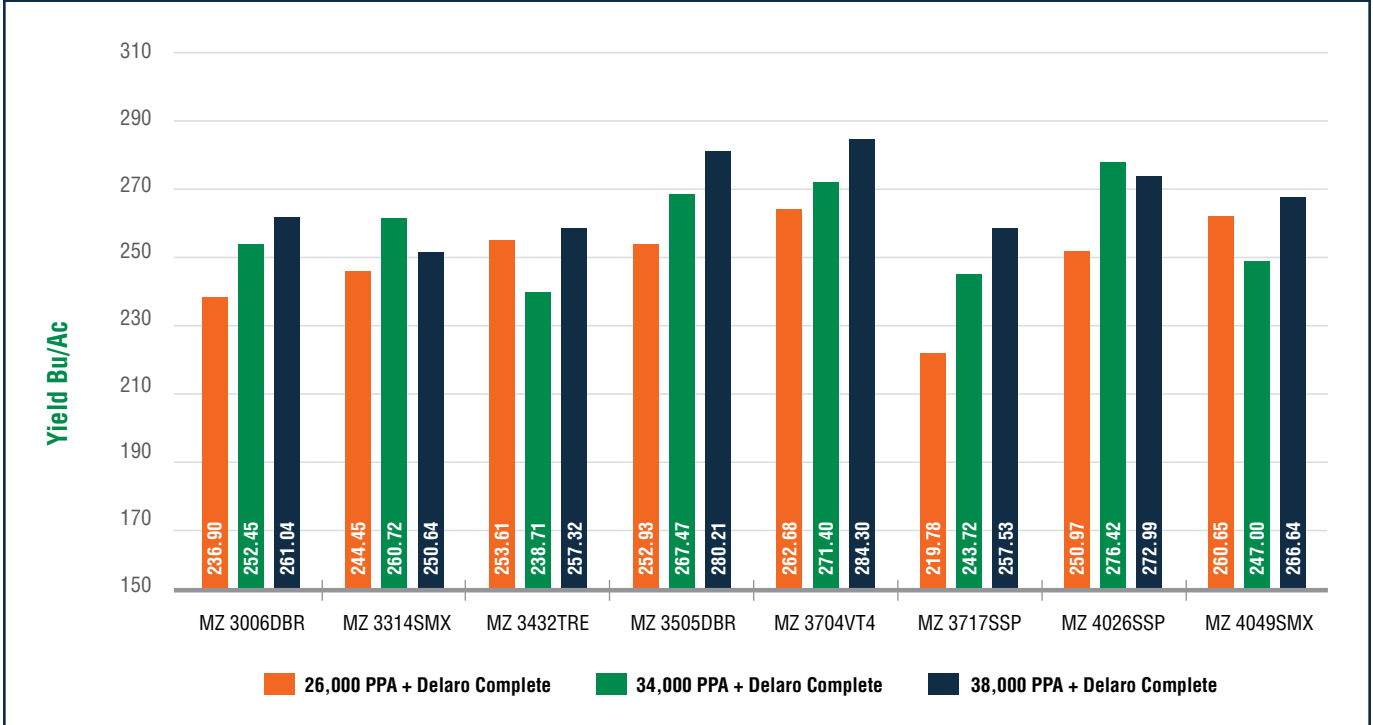
This aligns with historical observations that kernel mass hybrids under late-season water limitation often maximize yield between 32,000–36,000 PPA.

3. Highly Population-Responsive Hybrids

MZ 3505DBR showed strong response to higher populations, along with MZ 3006DBR, MZ 3704VT4, and MZ 3717SSP. These hybrids feature very upright leaf architectures. MZ 3704VT4 and MZ 3717SSP also possess shorter plant stature and narrower leaves, making them excellent candidates for higher plant densities.

Notably, at St. Hyacinthe, QC, both MZ 3704VT4 and MZ 3505DBR continued responding positively up to 40,000 PPA.

Graph 1: Embro, Ontario

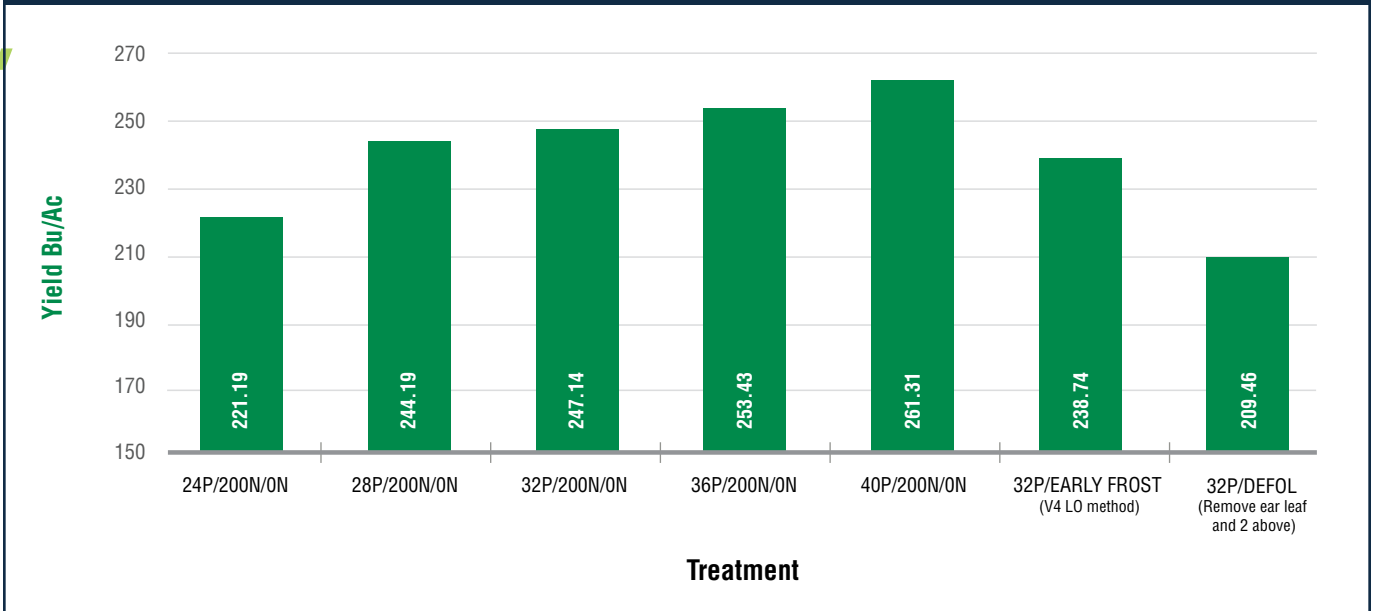


ST. HYACINTHE & ST. CÉLESTIN, QC

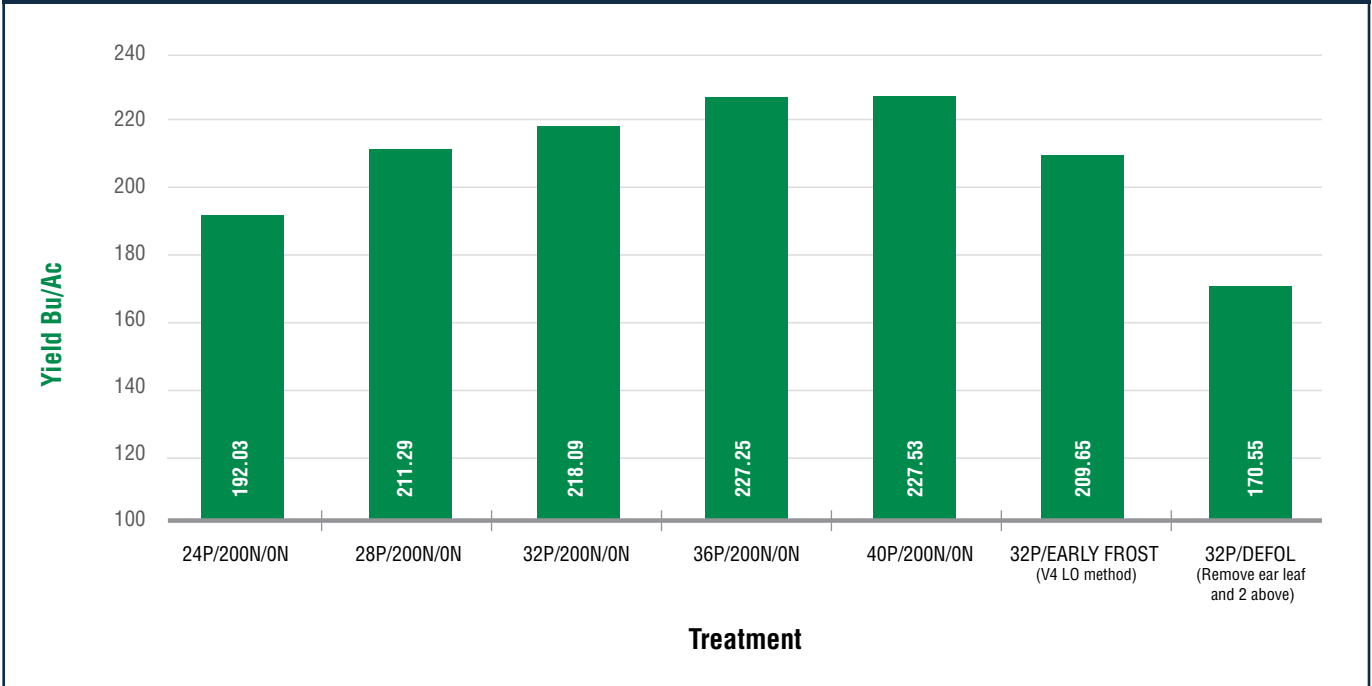
All treatments were managed at a constant 200 lbs N/ac and included:

- 24,000 PPA
- 28,000 PPA
- 32,000 PPA
- 36,000 PPA
- 40,000 PPA
- 32,000 PPA with early-season frost simulation (V4 cut-off plant)
- 32,000 PPA with late-season frost/disease simulation (R1 defoliation: ear leaf plus two leaves above removed)

Graph 2: St. Hyacinthe, Quebec



Graph 3: St. Célestin, Quebec



Quebec Results: A Unique Population Year

Results were similar at both Quebec locations and showed a very strong overall positive response to increasing population, with minimal hybrid separation.

- St. Célestin (70–90 CRM hybrids) yields topped out at 36,000 PPA.
- St. Hyacinthe (94–98 CRM hybrids) yields topped out at 40,000 PPA.

Historically, we have not observed such aggressive population responses in Quebec. However, 2025 appears to have been unique.

The early frost prevented both sites from fully finishing, shifting yield determination toward volume rather than kernel mass accumulation. Our team believes higher population treatments likely maintained kernel size similar to lower populations because the season did not allow lower populations to capitalize on additional kernel weight. As a result, higher populations won through sheer kernel number per acre.

Frost Simulation Findings

Early Frost (V4 Simulation)

The simulated early frost treatment reduced yield by approximately 8–10 bu/ac at both locations. This closely aligns with findings from R.W. Elmore and B. Doupnik Jr. (1995, *Journal of Production Agriculture*), where 70% frost defoliation at V4 resulted in limited yield loss.

These findings reinforce that, unless early frost results in near-total defoliation, replanting is rarely justified. Hybrid separation under early defoliation was minimal.

Late Defoliation (R1 Simulation)

Similarly, little hybrid separation was observed under R1 defoliation. However, future work may be better suited to defoliating at R3 to determine whether kernel mass hybrids are more negatively impacted than kernel number hybrids.

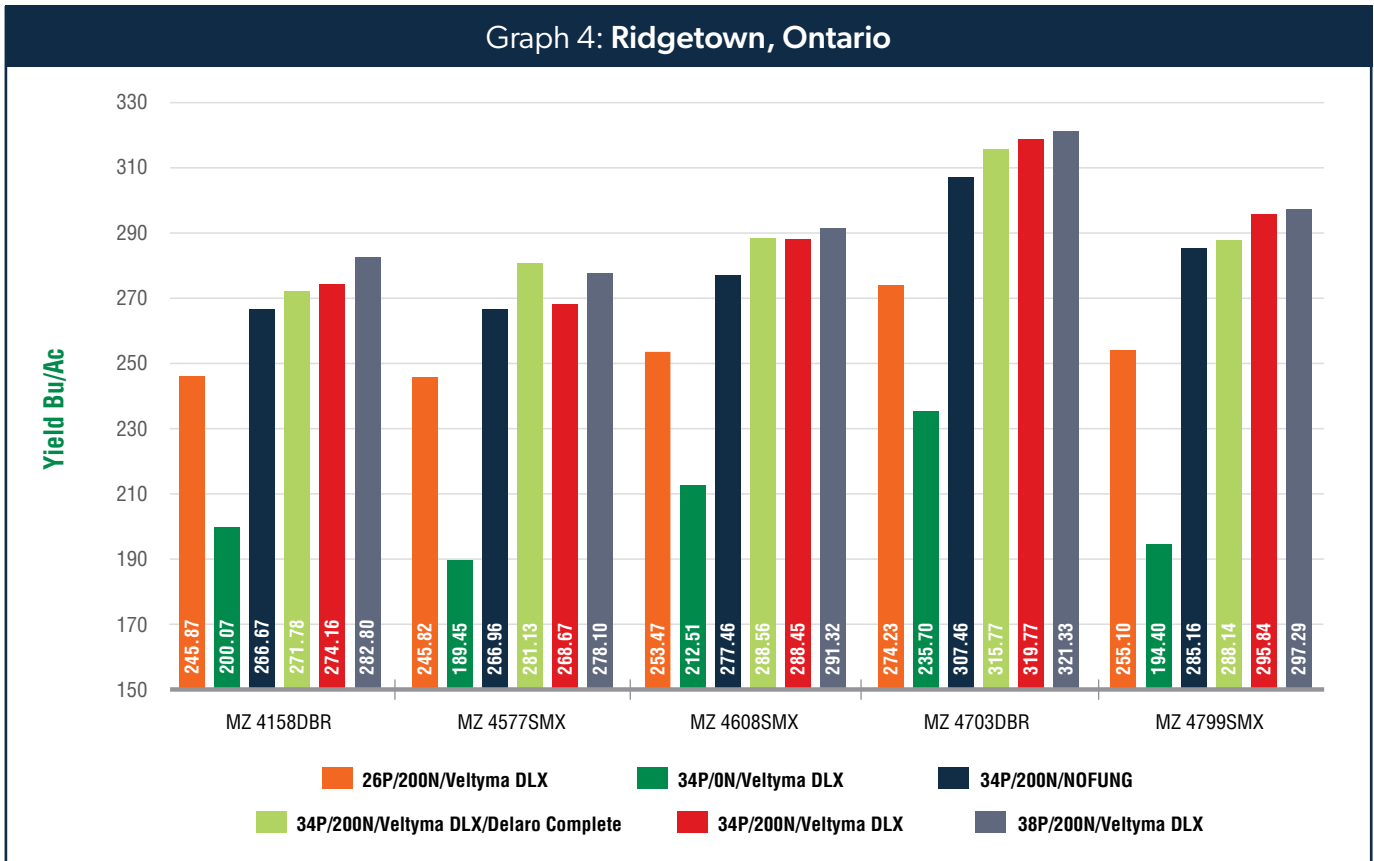
Removing the ear leaf and two leaves above resulted in the lowest-yielding treatment at both locations. This strongly reinforces the importance of protecting the ear leaf and upper canopy from disease to maintain yield potential.

RIDGETOWN, ON

The Ridgetown intensive management site was located at the University of Ridgetown Campus. Nitrogen was held constant at 200 lbs/ac across treatments, except for the zero-nitrogen control.

Treatments:

- 26,000 PPA – Veltyma DLX (VT/R1)
- 34,000 PPA – Veltyma DLX (VT/R1) + R3 Delaro Complete
- 34,000 PPA – Zero Nitrogen – Veltyma DLX (VT/R1)
- 34,000 PPA – Veltyma DLX (VT/R1)
- 34,000 PPA – No Fungicide
- 38,000 PPA – Veltyma DLX (VT/R1)



Key Trends from Ridgetown

Fungicide Response in a Lower Tar Spot Year

In 2025, tar spot pressure at Ridgetown was significantly lower than in previous seasons. As a result, fungicide response returned to a more “historical” level.

- A single fungicide application netted an average yield gain of ~8.5 bu/ac.
- It also increased grain moisture by approximately 0.75%.

The double fungicide application (VT/R1 + R3) did **not** provide an overall yield advantage, resulting in a slight yield reduction (-1.3 bu/ac) and an additional 0.25% moisture increase.

MZ 4577SMX – A Unique Response

MZ 4577SMX, an older hybrid with below-average tar spot tolerance, responded very differently:

- Nearly **13 bu/ac advantage** with the double application compared to a single pass.
- Limited response to a single fungicide application.

This suggests that, in a lower early-season disease year, the first fungicide pass may not have been critical for this hybrid, while the later R3 application helped maintain late-season plant health. That extended photosynthetic capacity likely allowed the hybrid to capitalize on late-season moisture and drive additional kernel mass.

It reinforces an important point: fungicide timing may matter more than fungicide frequency, particularly on hybrids with known disease weaknesses.

MZ 4703DBR in the Ridgetown, ON, trial, October 20, 2025.



34,000 PPA – Zero Nitrogen – Veltyma DLX (VT/R1)



34,000 PPA – No Fungicide



34,000 PPA – Veltyma DLX (VT/R1)



34,000 PPA – Veltyma DLX (VT/R1) + R3 Delaro Complete

Population Response at Ridgetown

Population trends again revealed clear hybrid separation.

Responsive to 38,000 PPA:

- MZ 4158DBR
- MZ 4577SMX

Both hybrids continued benefiting from increased population up to 38,000 PPA.

Parabolic Response (topped out at or near 34,000 PPA):

- MZ 4608SMX
- MZ 4703DBR
- MZ 4799SMX

These hybrids peaked at 34,000 PPA, with little or no gain at 38,000 PPA.

A Standout: MZ 4703DBR

When examining MZ 4703DBR more closely, several impressive observations emerge.

Aside from the 26,000 PPA and zero-nitrogen treatments, all other treatments yielded well over 300 bu/ac.

- Peak yield: 321.33 bu/ac
- Treatment: 38,000 PPA + Veltyma DLX (VT/R1)

Nitrogen Use Efficiency (NUE)

At 321.33 bu/ac with 200 lbs N/ac applied:
 $321.33 \div 200 = 0.62$ lbs N per bushel.

This is well below the commonly referenced 0.70–0.75 lbs N/bu guideline often used in Southern Ontario.

This suggests that, in extremely high-yield environments, additional applied nitrogen may not always be required at elevated rates because soil mineralization can supply substantial nitrogen throughout the growing season.

Soil mineralization is demonstrated below:

- MZ 4703DBR yielded 235.7 bu/ac with zero applied nitrogen.
- This was statistically higher than all other hybrids in the zero-N treatment.

This strongly suggests superior nitrogen-use efficiency relative to other hybrids in the trial. It also supports a broader industry observation: newer genetics appear to be improving NUE compared to older products. The zero-nitrogen performance of MZ 4703DBR may offer further evidence of that trend.

Moving Forward

At Maizex, we will continue to do research on intensive management strategies alongside a deeper understanding of corn yield components and hybrid flex. Our goal is to better define how hybrids respond under varying management strategies and environmental conditions.

In 2026, we plan to expand into more in-depth fertility and nutrient placement trials. These trials will help us better understand hybrid interactions with nutrient timing and placement, as well as responses to nutrients beyond nitrogen, particularly phosphorus and other key fertility components. We will also continue multi-location research evaluating population and fungicide responses. In select trials, we will further intensify management by examining nitrogen strategies, dual fungicide applications, and supplemental nutrient programs.

Our commitment remains clear: to better define intensive management scores and hybrid flex characteristics. We see this as a meaningful point of differentiation, helping growers determine where and when to position specific hybrids on their farms. Equally important is identifying which hybrids, whether driven more by kernel mass or kernel number, show stronger responses to population and fungicide management. Understanding these distinctions allows us to more precisely match hybrids to management style and yield environment.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

BUILDING BUSHEL:

When Kernel Mass Beats Kernel Count (and When It Doesn't)

Background

Understanding corn yield begins with understanding where that yield actually comes from. Breaking yield down into its core components helps explain why a hybrid may excel in one environment yet struggle in another. Identifying which yield components mattered most in each season or location also provides valuable context when interpreting plot results. In a season like 2025, truly a year of “haves and have-nots,” large swings in hybrid performance from site to site made this analysis especially important.

Yield can be simplified into the following relationship:

Yield = Population × Kernels per Ear × Kernel Weight (Kernels per Bushel).



Enormous kernel size/depth in MZ 3505DBR, October 2024.

With final yield, kernel weight, and population data in hand, we can estimate kernel number per ear and better determine what drove performance. This approach allows us to answer a key question when evaluating hybrids and environments: **was yield primarily driven by kernel number or by kernel weight?**

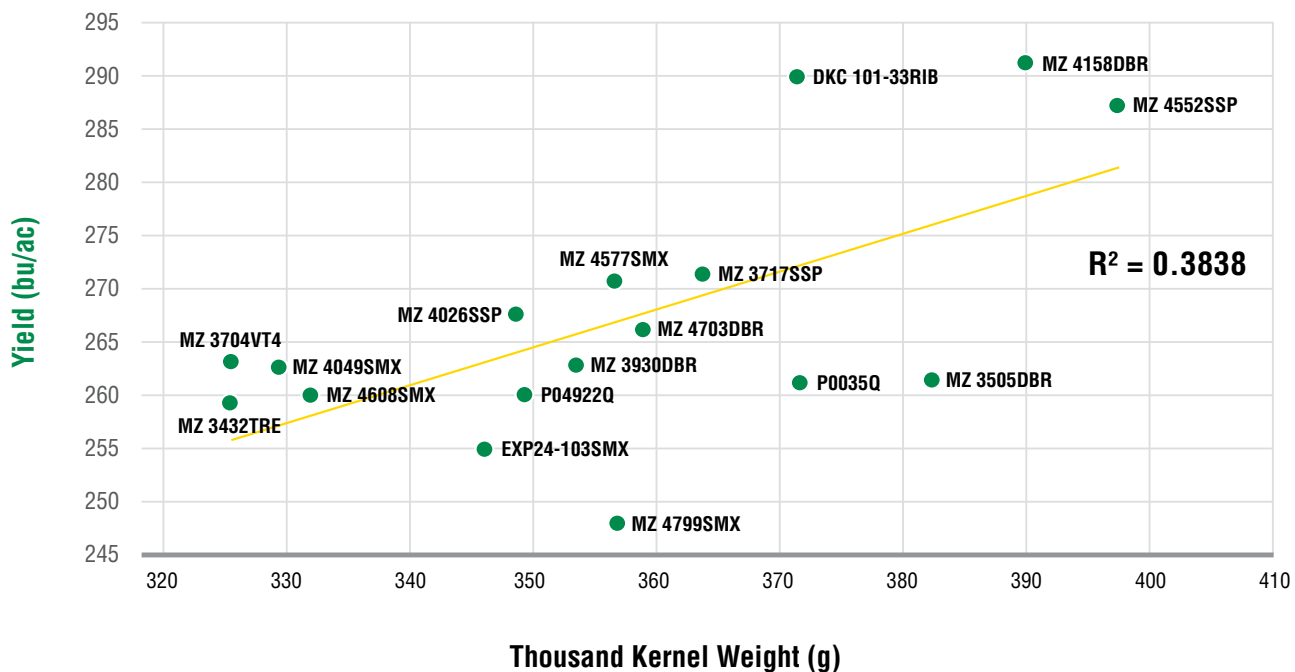
How It's Done

As used in trials in previous years, we continued using CountThis, an AI-based kernel counting app, to streamline yield component analysis. A photo is taken of a representative kernel sample, allowing the app to digitally count the kernels. We then weigh the same sample to pair kernel number with actual mass. Using the hybrid's grain moisture, kernel count, and sample weight, we then calculate thousand kernel weight (TKW) for each hybrid and plot.

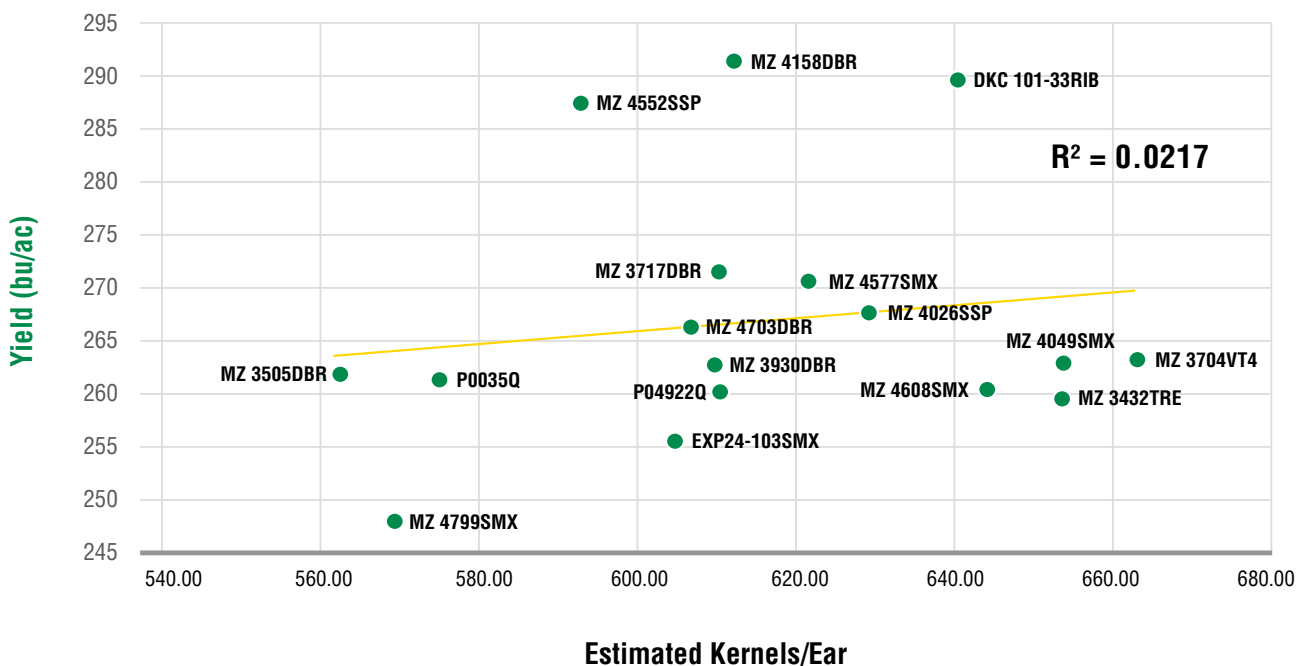
Throughout the season, plant stands were also measured across trial locations. By combining stand counts, final yield data, and TKW, we can estimate kernels per ear and better understand which yield components drove performance. After several years of using this process, we have developed a strong correlation for where specific hybrids typically fall in terms of kernel weight and kernel number, allowing for more meaningful comparisons across locations and seasons.

For example, MZ 4158DBR typically ranges between 360–420 g/1000 kernels (approximately 60,000–70,000 kernels per bushel). While this hybrid may occasionally fall outside that range, it is usually only under severe stress or exceptionally favorable growing conditions. In comparison, a hybrid like MZ 4608SMX more commonly falls between 295–360 g/1000 kernels (roughly 70,000–85,000 kernels per bushel). However, MZ 4608SMX frequently ranks near the top of the plot for estimated kernels per ear. This is particularly true in environments where it is also among the highest-yielding hybrids.

Graph 1: Port Dover, ON - Yield vs. TKW



Graph 2: Port Dover, ON Yield vs. Estimated Kernels per Ear



Results and Discussion

The wide east–west variability across Ontario in 2025 exposed trials to very different seasonal stresses, producing some interesting and contrasting results. Looking back on the season, it became clear that, in areas with exceptionally high yields, kernel weight was likely a major driver, as overall ear size and final stands were generally not exceptional across many locations.

In *Graph 1* (Yield vs. TKW) from Port Dover, ON, we see a clear upward trend in yield as TKW increases. The trendline shows an R^2 value of 0.3838. R^2 is a statistical measure that indicates how much of the variation in yield can be explained by the measured factor. In this case, approximately 38.4% of the yield variation was associated with changes in TKW. Notably, the three highest-yielding hybrids also ranked among the top five for TKW, demonstrating that heavier kernels translated directly into higher yields at this location. Newer genetics continue to push kernel mass higher through larger, deeper kernels.

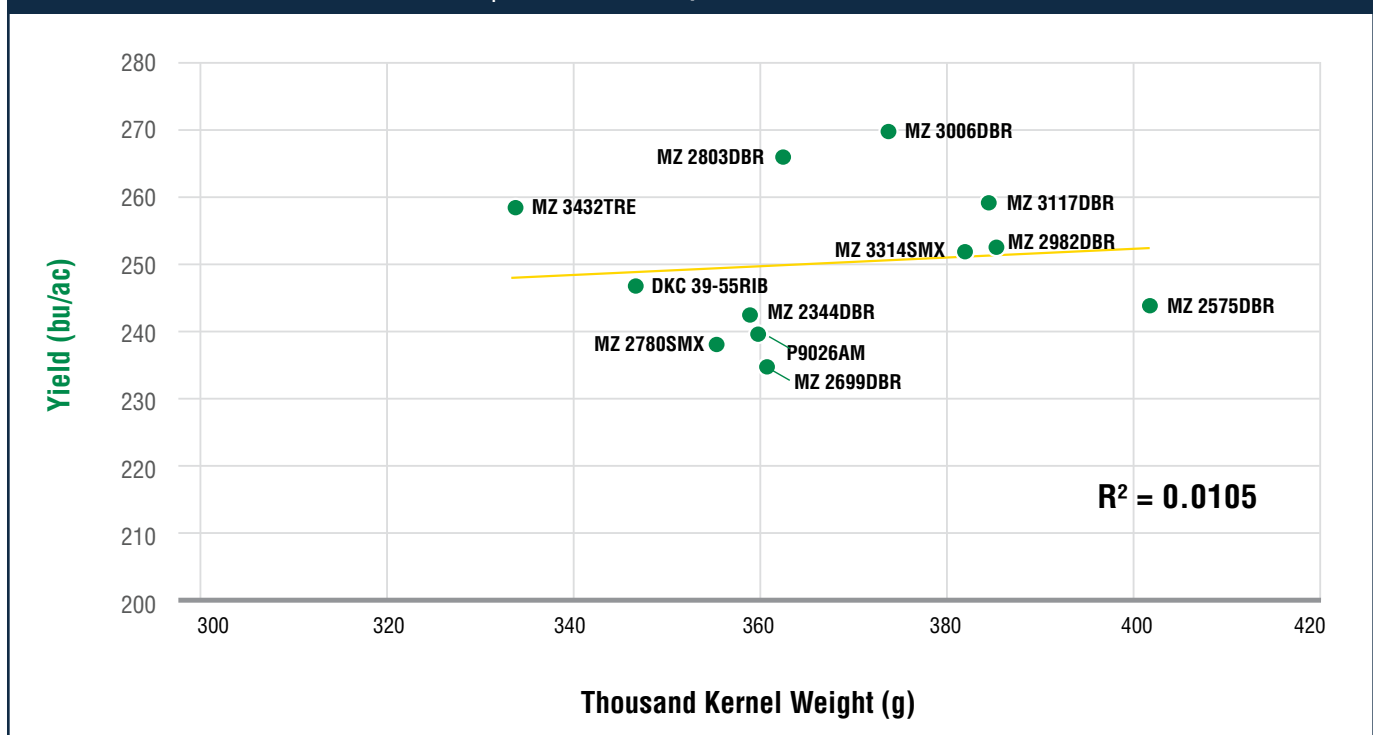
Graph 2 tells a very different story when examining estimated kernel number per ear at the same location. Here, the R^2 value was only 0.0217, meaning just 2.17% of the yield variation could be attributed to kernel number. This confirms that at Port Dover, yield was driven much more by kernel weight than by kernel count. A second nearby location on a different soil type roughly 15 km away showed similar trends,

with TKW accounting for just over 37% of the yield variation. These results highlight how favorable late-season weather and management likely allowed kernel mass–driven hybrids to continue building yield during grain-fill, particularly where late-season rains were available.

However, moving north to Harriston, ON, we observed almost the opposite relationship. In *Graph 3* (Yield vs. TKW), the R^2 value dropped to just 0.0105, meaning only about 1.05% of yield variation could be explained by changes in TKW. Conversely, *Graph 4* (Yield vs. Estimated Kernel Number) showed an R^2 of 0.3749, indicating that approximately 37.5% of yield variation was driven by differences in kernel number per ear.

The key differences between these sites appear to be pollination success and final maturity conditions. Port Dover experienced nearly ideal pollination conditions, with strong kernel set and full maturity, and harvest moistures generally ranged from 19–26%. In contrast, Harriston faced a challenging pollination period that led to significant tip-back and kernel abortion in some hybrids, along with insufficient late-season heat to fully finish later-maturing genetics. As a result, yield became more dependent on kernel number, essentially a volume-driven system where more kernels compensated for lighter grain. Harvest moistures at Harriston reflected these challenges, ranging from 27–35%.

Graph 3: Harriston, ON Yield vs. TKW



Moving Forward

As we move forward, we will continue to place a strong emphasis on analyzing corn yield components. At Maizex, we see yield component analysis as a very important part of understanding hybrid performance across environments and management systems. While final yield is the ultimate measurement, understanding how that yield was achieved provides far greater insight into hybrid strengths, weaknesses, and consistency under varying conditions.

Kernel mass or TKW is a particularly important component because it helps explain differences that cannot be captured by test weight alone. Test weight is simply a measurement of bulk density or volumetric mass; it reflects how grain packs together in a container rather than the actual weight and development of individual kernels. Kernel mass, on the other hand, provides a direct measure of grain-fill and plant health during the late reproductive stages.

Moving forward, alongside traditional metrics such as moisture, test weight, and total yield, we will continue to prioritize TKW as a core measurement within our evaluation program. We will also focus on collecting accurate final ear counts to better quantify kernels per ear. By combining

kernel mass with detailed ear and kernel number data, we can more precisely determine whether yield was driven by stand establishment, pollination success, or grain fill.

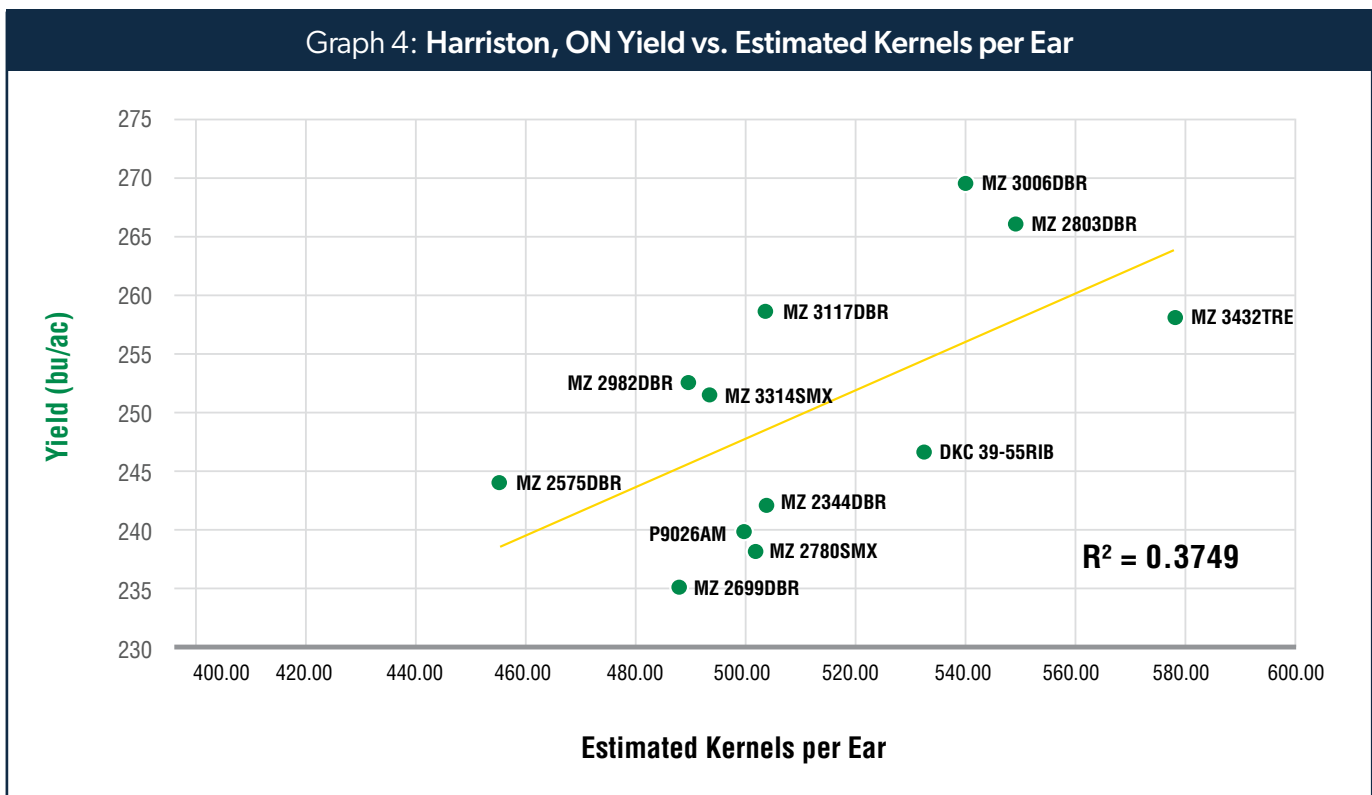
We believe that the interaction between kernel number and kernel mass is central to understanding hybrid stability. Evaluating these components allows us to better match hybrids to specific soil types, management practices, and regional growing conditions.

Attention will be given to new hybrids entering commercial sales for the first time this fall. Detailed yield component analysis will help ensure these hybrids are positioned appropriately within our lineup and placed in the right environments and fields on farm. This will help farmers to maximize hybrid success in 2026 and beyond.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

Graph 4: Harriston, ON Yield vs. Estimated Kernels per Ear



Smarter Hybrid Placement

Recently, there has been increased focus on understanding corn yield components. Corn yield is determined by the interaction of three primary factors: plant population × kernels per ear × kernel weight.

These components are negatively associated with one another, meaning when one component increases, another often decreases. Each hybrid has a defined genetic potential for ear and grain development. Every management decision, from planting through harvest, influences how much of that potential is ultimately realized.

Hybrids differ in how they respond to environmental and management conditions. Some hybrids exhibit limited flex, while others show greater flex. Hybrids can flex in three main ways:

- Rows around (ear girth)
- Kernels per row (ear length)
- Kernel mass (kernel depth/weight)

Some hybrids flex across all three components, while others flex primarily in one or two areas. Importantly, hybrids tend to flex in consistent ways year over year; the environment largely determines the magnitude of that flex. It is also important to recognize that hybrids do not ‘flex up’ in yield but rather can only ‘flex down.’ Environmental stress drives yield loss, while management decisions help minimize the negative impact of stress and preserve yield potential. Each hybrid has a defined genetic ceiling for maximum ear girth (rows around), ear length (kernels per row), and kernel depth or mass. When a plant competes for water, nutrients, and sunlight, or experiences other environmental stresses, it does not create new yield potential; instead, it pulls back, or flexes down, to a lower ceiling in one or more of these components.

Given that yield components are determined at different times during the growing season in different hybrids, it stands to reason that management timing can directly influence flex expression. The industry has generally adopted four categories of hybrids according to when they build these yield components:

1. G - Ear girth (rows around): V2–V6
2. L1 - Ear length (kernels per row): V8–VT/R1
3. L2 - Ear length (kernels per row): R1–R3 kernel abortion
4. D - Kernel depth or mass: R1–R6

It should be noted that L2 hybrids are less common than the other flex categories, and their discussion here will be limited. Understanding when all of these components are set allows management to be timed to protect the most vulnerable yield component.

Analyzing flex at these specific growth stages helps match hybrids and management strategies to the right environments. At Maizex, flex is used to help categorize hybrids as KM (kernel mass) or KN (kernel number) hybrids, providing a simplified way to understand how yield is most likely to be protected or lost under stress.

- KM hybrids would be described as ‘D’
- KN hybrids would be described as ‘G’ or ‘L1’

Practically, this classification helps identify whether a hybrid is more likely to lose yield potential before pollination (reductions in ear size and kernel number) or after pollination (reductions in kernel depth and weight).

How We Did It

As in seasons past, our protocol closely follows the work conducted by PT Sullivan Agro in Eastern Ontario.

To study flex, we use plant population, one of the most effective and practical management tools for evaluating hybrid flex. Increasing population increases inter-plant competition for light, water, and nutrients, much of which is driven by reduced root mass per plant at higher populations. This controlled competition allows us to observe how hybrids respond to stress and where yield components are most likely to flex.

A base population of 24,000–26,000 plants per acre (PPA) is used to establish each hybrid’s baseline yield potential while minimizing the risk of double-ear formation.

From there, an upper population tier of approximately 38,000 PPA is used to evaluate hybrid response under higher competition stress compared to the lower population baseline.

Including an intermediate population, typically 32,000–34,500 PPA, allows us to develop full population response curves for each hybrid using both small-plot and field-scale data.

At Maizex, flex evaluation is conducted using a combination of small-plot trials and field-scale strip trials. In strip trials, variable rate (VR) seeding technology is used to adjust population within the same hybrid strip, allowing multiple populations to be tested within a single pass across the field. This approach provides real-world performance data across varying soil types and environments.

At maturity, we hand-harvest or pull 10 uniform, representative ears from each population zone. These ears are then evaluated for individual yield components, including:

- Rows around (ear girth)
- Ear length (kernels per row)
- Kernel mass (determined after shelling and weighing grain)

This component-level analysis allows us to directly measure how each hybrid flexes under increasing stress and helps refine hybrid placement, population recommendations, and management strategies for different environments.

Results in 2025

When reviewing the 2025 data, many hybrid trends remained consistent year over year. However, drought periods in the southeastern part of the province appeared to influence performance at both the Jarvis and Embro trial locations. *Table 1* on the following page shows a snapshot of three hybrids evaluated at Jarvis, ON, each demonstrating different flex characteristics. Flex percentage is calculated using the difference in ear weight between high and low populations. We then determine how much of that lost weight is attributed to specific flex components: girth, length, or depth/kernel mass.

Typical Hybrid Flex Percentages

- Length: 60–70% of flex
- Girth: 0–20%
- Depth (TKW/kernel mass): 10–30%

These averages help classify hybrids. Hybrids near or above the upper end of these ranges are typically categorized by that flex type. Girth and length flex hybrids are generally classified as KN hybrids, while depth-flexing hybrids are considered KM hybrids. At Jarvis, we observed low girth flex, which is common for that location, and higher flex in depth or kernel mass, which is also typical for this environment.



Ears of MZ 3006DBR from the high-population trial.



Ears of MZ 3006DBR from the low-population trial.



Ears of MZ 4608SMX from the high-population trial.



Ears of MZ 4608SMX from the low-population trial.

Hybrid Summary

MZ 3006DBR

Demonstrated classic KM hybrid behavior, flexing over 30% in kernel mass. It also flexed above average in ear length, suggesting classification as an L1-D hybrid.

MZ 4026SSP

A strong example of a KM/KN hybrid that may shift classification depending on the season. Historically viewed as purely KM, expanded location testing now shows consistent kernel number flex as well. It would likely classify as a G-L1-D hybrid, showing roughly average flex across all components.

Hybrids such as MZ 4026SSP, which flex across all areas, can be more management sensitive. However, when managed correctly throughout the season, they can outperform many other hybrids—the typical ‘racehorse’ or ‘princess’ hybrid.

MZ 4608SMX

Represents a classic KN hybrid. It has shown among the highest row flex for two consecutive years and demonstrates strong length flex. This hybrid would classify as a G-L1 hybrid.

These hybrids often perform well at lower populations and can be solid options on drought-prone soils where plant establishment is not a challenge but late-season moisture can limit yield during grain-fill.

Table 1. **Three Hybrids from the Jarvis, ON, Trial.**

Hybrid	Population	Kernels Around	Kernels in Length	Kernels/Ear	TKW	Kernels/bu	Calculated Yield
MZ 3006DBR	26,000	16.4	42.7	700.28	367	69212.53	263.06
MZ 3006DBR	38,000	16.4	37.5	615	298	85238.26	274.17
Difference	-12,000	0.00	-5.20	85.28	-69.00	-16025.72	11.11
% of Flex		0%	66.9%	66.9%	33.13%		
MZ 4026SSP	26,000	16.60	37.90	629.14	411.00	61802.92	264.67
MZ 4026SSP	38,000	16.20	30.80	498.96	325.00	78156.92	242.60
Difference	-12,000	-0.40	-7.10	130.18	-86.00	-16354.00	-22.08
% of Yield Loss Due to Flex		7.24%	67.56%	74.80%	25.20%		
MZ 4608SMX	26,000	20.20	34.30	692.86	358.00	70952.51	253.89
MZ 4608SMX	38,000	19.20	25.30	485.76	325	78156.92	236.18
Difference	-12,000	-1.00	-9.00	207.1	-33.00	-7204.41	-17.72
% of Flex		11.83%	80.83%	92.66%	7.34%		
Site Average % Yield Loss Due to Flex		8.65%	64.20%	72.85%	27.15%		7.34%

Bold and italicized data represents flex above the site average.

Moving Forward

At Maizex, we will continue to study hybrid flex. Understanding flex is crucial as it allows growers and agronomists to move beyond simply selecting the highest yielding hybrid and instead focus on placing the right hybrid in the right environment. In high productivity environments with strong fertility, consistent moisture, and lower overall stress risk, hybrids that rely more heavily on kernel mass (KM-type hybrids) can maximize yield potential. These environments are more likely to support full kernel-fill through grain-fill, allowing these hybrids to fully express their genetic yield potential.

In more variable or stress-prone environments, such as lighter soils, drought-prone regions, or highly variable fields, kernel number (KN-type) hybrids can provide greater yield stability. Protecting maximum kernel number early in the season helps ensure a strong yield foundation even if late-season stress limits kernel depth or weight.

Management can also be targeted to hybrid flex characteristics:

KN Hybrids (Early-Season Focus):

- Planting conditions
- Starter fertility
- Residue management
- Early nitrogen availability

KM Hybrids (Late-Season Focus):

- Late-season nitrogen availability
- Disease management / fungicide use
- Stress mitigation during grain-fill

Ultimately, understanding hybrid flex is another tool that helps translate genetic yield potential into realized yield. By matching hybrid characteristics with environment and management, growers can reduce risk, improve consistency, and capture more of the genetic yield potential available in today's hybrids.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

The High Population Yield Gap

Background

Corn plant populations have increased consistently over the last five decades, and these higher populations, when combined with improved genetics, have resulted in revolutionary improvements in corn yields. One of the clear indicators of genetic improvement has been the ability for modern hybrids to handle higher populations while generally maintaining kernel number and kernel mass. However, when corn yield components are evaluated, one notices the give and take among yield components as populations increase. That is, you can't raise plant populations (ear count) by 20% and expect a 20% increase in yield because kernel number and kernel mass will contract somewhat under the stresses caused by greater plant competition.

High seeding rates in good conditions that lead to high ear counts offer both higher yield potential and higher stresses that can pull kernel counts and kernel mass backwards. What are the key management options to capitalize on this higher potential in high populations?

The idea of pushing populations and maintaining ear characteristics to result in significant yield improvements has been the focus of considerable research in Ontario. Findings to date have included the ideas that if you raise population by 5,000 plants per acre, use additional nitrogen, and use an R1 fungicide application, these can be key contributors to improving kernel count and kernel mass in order to have a significant net yield gain from the increased population.



Figure 1. An example of high-population corn.

How it was Done

Is there more to be done with corn management to unlock the potential of high populations? To try to get answers to this intriguing notion, we set up experiments in 2025 with elevated populations and an eye to carefully looking at yield components. The aim was to see which yield component was most likely to be the weakest link as ear counts were pushed higher. *Table 1* illustrates the findings from the Lambeth site, which demonstrate a few things. First, this site had a good seed bed, utilized good quality seed, and had excellent planter performance. You cannot achieve Ear Count Conversions of 97% (36,780 / 38,000) without hitting on all cylinders.

Table 1. **Impact of seeding rates on corn yield components and final yields on a high-yielding site in Lambeth, Ontario, 2025. Small plot results.**

Target Seed Drop (seeds per acre)	Final Ear Count (ears per acre)	Rows Around	Ear Length	Kernels per Ear	Kernel Mass (kernels per bushel)	Yield (bu/acre @15.5%)
32,000	30,760	18.2	38.4	698	75,834	284
38,000	36,780	18.6	34.6	644	81,782	291

Results and Discussion

Notice that the high density had no negative impact on ear girth (rows around), but ear length pulled back 9.8% and kernel mass was reduced by 7.8%, resulting in a yield increase of only 7 bushels per acre (2.5%) even though the ear count increased 19.6%. Imagine for a moment if we could have pushed the population up to 36,780 and held on to the ear characteristics as they were at the 30,760 population; the final yield would have been 339 bu/acre. That is 48 bu/ac more than what was realized. Now, some will say you should be grateful that the soil capacity of the field and seasonal rainfall allowed you to achieve the yields you received! Point taken, but the big question and the goal moving forward is to identify the management options that might allow us to close this gap.

On this particular field, we examined three levels of fungicide applications: 1) control, 2) single application at R1, and 3) double applications of fungicide at both R1 and R2. In addition, the biostimulant YieldON was applied both in single (R1) and double applications (R1 and R2). The takeaways are preliminary, but at this site, the second fungicide (R2) added 9 bu/acre, and the biostimulant YieldON, when applied twice (R1 and R2), improved yields by 11 bu/ac.

Moving Forward

Looking ahead, the sights are clearly set on capturing more of the yield potential that exists in corn fields that have final ear counts in the 36–38,000 ears per acre range. *Table 2* outlines some of the ideas that came out at various winter meetings this year on how to improve high population yields. Of course, we realize that improvement in hybrids has been the key over the decades to handling higher populations and generating more yield. This will likely not change, but understanding how to augment genetic improvement is an exciting endeavor to focus on!

Table 2. **Potential agronomic solutions to boost high population corn yields.**

Foliars	Fertility	Spacing
<ul style="list-style-type: none">• Fungicides• Biostimulants• Plant growth regulators• Micronutrients	<ul style="list-style-type: none">• Additional late N• Elevate soil test K• Concentrate fertility in row zone	<ul style="list-style-type: none">• Move to narrow rows• Precise in-row spacing

Acknowledgments

This article was written by Greg Stewart, Syngenta Canada, and Henry Prinzen, Maizex Seeds. Appreciation is expressed to Mapleview Farms for co-operation at the Lambeth Site. YieldON is a biostimulant from Syngenta Canada.

Upfront vs. Side-dress: Two Years of On-farm Research

Background

As farm operations continue to grow and time becomes more limited, nitrogen application strategies are evolving. Many farmers are shifting toward one-pass systems, applying most or all nitrogen ahead of planting and supplementing through the planter. Others continue to rely on a split-application approach, using starter nitrogen followed by a side-dress application at the V4–V6 growth stage.

To help answer a key management question—*what is the most efficient use of nitrogen in corn production: all upfront or side-dress timing?*—Senior Territory Manager Chuck Belanger initiated a two-year on-farm trial. With labour constraints and changing management practices influencing decisions, understanding the most effective nitrogen strategy has become increasingly important.

To evaluate each approach under real Ontario growing conditions, the trial compared full upfront nitrogen programs with in-season side-dress applications across contrasting soil types and weather environments.

How It Was Done

2024

The first year of the trial was conducted in Chatham-Kent on a sandy soil. The field was conventionally tilled, with fertilizer broadcast ahead of tillage on the upfront nitrogen section. The nitrogen source consisted of a 60/40 blend of ammonium sulfate and ESN applied at a total rate of 220 lbs of nitrogen.

The side-dress treatment received 175 lbs of nitrogen in the form of 28% UAN applied in-season without a stabilizer.

2025

The second year was conducted in Essex County on heavy clay soil under a no-till system. A minimal tillage pass had been completed the previous fall. The upfront nitrogen treatment remained consistent with the prior year, using a 60/40 blend of ammonium sulfate and ESN at 220 lbs of total nitrogen applied to the soil surface.

The side-dress treatment received 175 lbs of nitrogen as 28% UAN applied at the V4–V6 stage using a converted NH₃ applicator equipped with aggressive closing discs to improve soil coverage. No stabilizer was used.

Following observations from the first year, nitrogen monitoring was expanded in 2025. Soil nitrate tests were conducted just prior to side-dressing (see *Table 1*). As expected, nitrate levels were adequate in the upfront treatment and deficient in the side-dress plots prior to application.

At flowering (VT), ear leaf samples were collected to assess plant nitrogen availability. Results contrasted sharply with earlier soil nitrate measurements (see *Figures 1 & 2*). Nitrogen levels were significantly lower and deficient in the upfront treatment compared to the side-dress nitrogen, indicating reduced nitrogen availability during critical yield formation stages.

Both seasons also displayed clear visual nitrogen deficiency symptoms within the upfront nitrogen treatments.

Table 1. **Soil Nitrate Report**

Date Sampled	Sample ID	Nitrate-N (PPM)	Nitrogen/LBs/Acre
2025-06-24	Upfront “N”	30.2681	121
2025-06-24	Side-dress “N”	7.6376	31



Side-dress N (left) vs. pre-plant 220 lbs. N (right) from Essex County trial, July 28, 2025.

Figure 1

Date Reported **2025-07-30**

S = Sufficiency Ranges, B = Balance Interpretation

Lab ID	Sample ID	Date Recv	Crop Type	Plant Stage	Plant Part	NBI	Protein	Fibre	Photosynthate Percent (%)	Starch	Mineral	Other			
P20252242	Sidedress N	2025-07-29	Corn	VT	Leaf	76	17.3	58.0	11.8		6.0	6.9			
			Nitrogen	Phosphorus	Potassium	Sulfur Percent (%)	Magnesium	Calcium	Sodium	Zinc	Iron	Manganese PPM	Copper	Boron	Aluminum
S	2.77	0.26	1.99	0.18	0.25	0.55	0.01	31	122	17	12.8	9.2	56		
B	-0.9	-4.8	3.3	2.7	-0.3	-0.4	5.8	5.2	-31.5	15.6	5.3				
Sap Nitrate (ppm)															

Figure 2

Date Reported **2025-07-30**

S = Sufficiency Ranges, B = Balance Interpretation

Lab ID	Sample ID	Date Recv	Crop Type	Plant Stage	Plant Part	NBI	Protein	Fibre	Photosynthate Percent (%)	Starch	Mineral	Other			
P20252241	Upfront N	2025-07-29	Corn	VT	Leaf	117	15.0	59.5	12.9		5.6	7.0			
			Nitrogen	Phosphorus	Potassium	Sulfur Percent (%)	Magnesium	Calcium	Sodium	Zinc	Iron	Manganese PPM	Copper	Boron	Aluminum
S	2.40	0.24	2.05	0.15	0.26	0.49	0.01	31	104	11	10.1	7.5	46		
B	-0.7	-1.1	15.2	2.9	4.5	-0.2	15.3	7.6	-55.6	7.2	6.4				
Sap Nitrate (ppm)															



Both seasons showed visual signs of nitrogen deficiencies in the upfront nitrogen trials.



Side-dress (left) vs. upfront (right) from Essex County trial, September 22, 2025.

Table 2. **Two-Year Nitrogen Application Trial**

Year	Trial	Variety	Moisture	Yield	Difference
2024	Upfront	MZ 4799SMX	18.0	215.5	-35.0
2024	Side-dress	MZ 4799SMX	17.6	250.5	35.0
2025	Upfront	MZ 4799SMX	20.6	190.9	-33.8
2025	Side-dress	MZ 4799SMX	21.7	224.7	33.8



Both seasons showed visual signs of nitrogen deficiencies in the upfront nitrogen trials.

Results & Discussion

Crop development and tissue analysis aligned with visual observations throughout both growing seasons. Key factors influencing performance included nitrogen source selection, stabilizer use, soil type, application method, and management practices.

Across both years, side-dress nitrogen consistently outperformed upfront nitrogen applications (see *Table 2*). The ability to apply nitrogen closer to peak crop demand improved nitrogen availability later in the season and supported stronger yield performance.

While the yield gap between treatments was notable, improvements to upfront nitrogen management including stabilizer use and enhanced incorporation may help reduce that difference in future trials.

Several environmental and management factors contributed to the outcomes observed:

- 2024 – sandy soil: Heavy early-season rainfall likely resulted in nitrogen loss through leaching and denitrification. No ear leaf tissue samples were taken that year to quantify late-season nitrogen availability.
- 2025 – heavy clay no-till: Early drought conditions likely contributed to volatilization losses, as upfront nitrogen was surface-applied and left unprotected. Although ESN was included, the urea component may have benefited from a stabilizer. The side-dress treatment also benefited from improved placement and soil coverage through aggressive closing discs.

These findings reinforce the importance of matching nitrogen strategies to soil type, weather patterns, and application practices.

Moving Forward

Future research will focus on improving upfront nitrogen performance while continuing to evaluate in-season application strategies. Planned adjustments include stabilizing upfront nitrogen and improving soil incorporation to reduce volatilization risk.

Additional treatments will include Y-Drop side-dress applications comparing protected and unprotected nitrogen placed beside the row. The 2026 trial site will be located on clay loam soil to further evaluate nitrogen timing across varying soil textures.

Continued research will help refine nitrogen management practices and identify strategies that maximize efficiency while supporting strong yield potential.

Acknowledgments

This article was written by Chuck Belanger, Senior Territory Manager with Maizex.

Intensive Silage Review

Background

In 2025, we continued our intensive silage management trial in Embro, Ontario. The primary objective this season was to evaluate planting population responses for both yield and feed quality. Given the consistent positive response observed over the past several years from a VT fungicide application, both in terms of yield and quality, a VT fungicide was applied to all treatments in 2025 as a best management practice. This allowed us to isolate population effects while maintaining a high level of plant health across treatments.

How We Did It

Each hybrid was planted above the intended target population and then thinned to achieve the desired final ear count. This ensured accurate and uniform stand establishment across treatments.

The trial consisted of four replications per hybrid at each population level. All harvested samples were submitted to a laboratory for detailed silage quality analysis, including fibre digestibility, starch concentration, and overall milk production potential.

Treatments included:

- 30,000 plants per acre (final stand) + Delaro Complete + Proline
- 36,000 plants per acre (final stand) + Delaro Complete + Proline

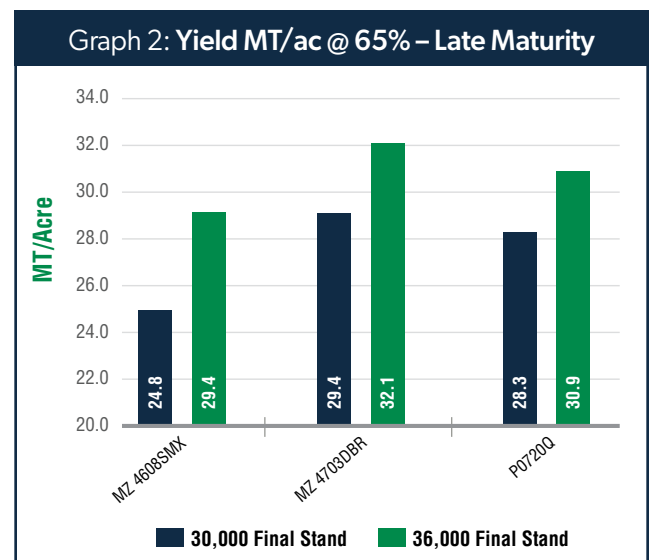
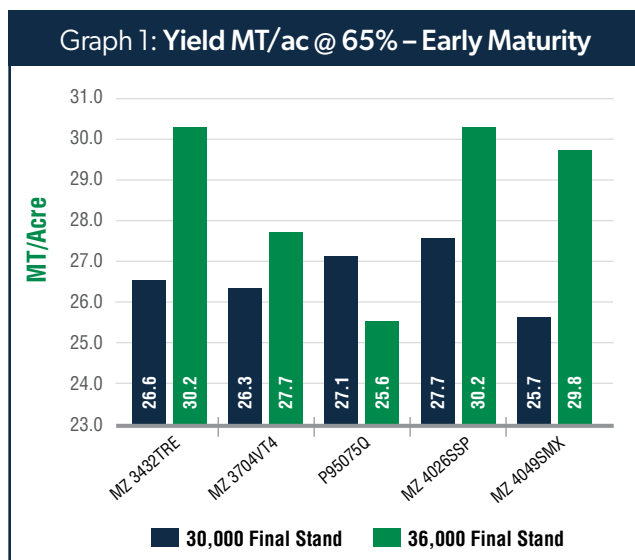
This design allowed us to directly compare how hybrids responded to increased population under intensive management conditions.

Results

Yield Response

In 2025, yield increased for every Maizex hybrid evaluated when planted at the higher population. The Embro site features a deep loam soil with strong fertility, enabling it to support elevated populations with minimal stress.

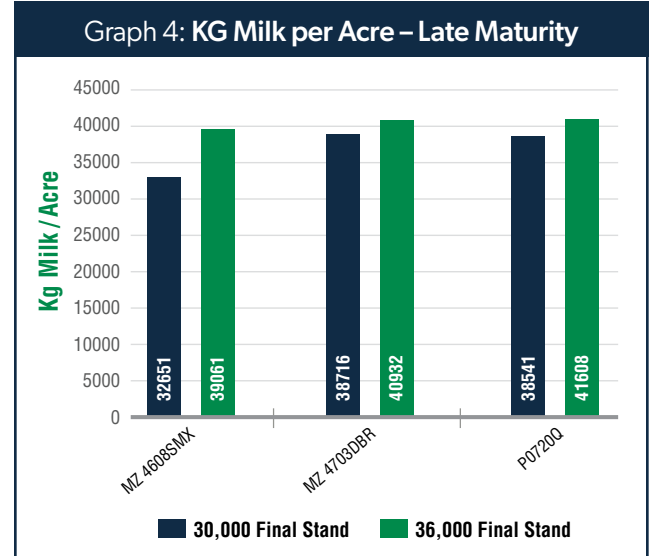
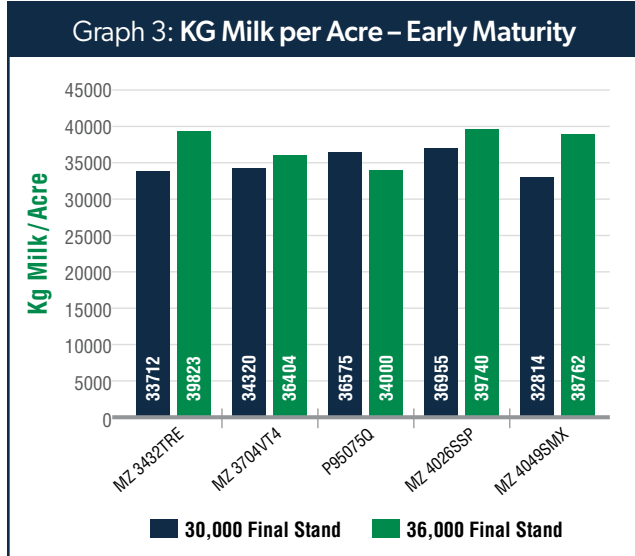
Even girthy, kernel-number-oriented hybrids such as MZ 3432TRE, MZ 4049SMX, and MZ 4608SMX responded positively to higher plant densities. However, on more drought-prone or lighter-textured soils, we would expect these hybrids to perform comparatively better at lower populations, where they can better preserve yield potential under stress conditions.



Milk per Acre

Milk per acre was calculated using the Milk2024 equation (milk per tonne × tonnes per acre). This provides a gross estimate of the potential milk, or similarly, beef production per acre from each treatment.

Overall, feed quality was not significantly reduced at the higher plant populations. When combined with the increase in tonnage per acre, every Maizex hybrid demonstrated a positive response in milk production per acre at 36,000 plants. From a profitability standpoint, this reinforces the value of optimizing stand density in high-yielding silage environments.

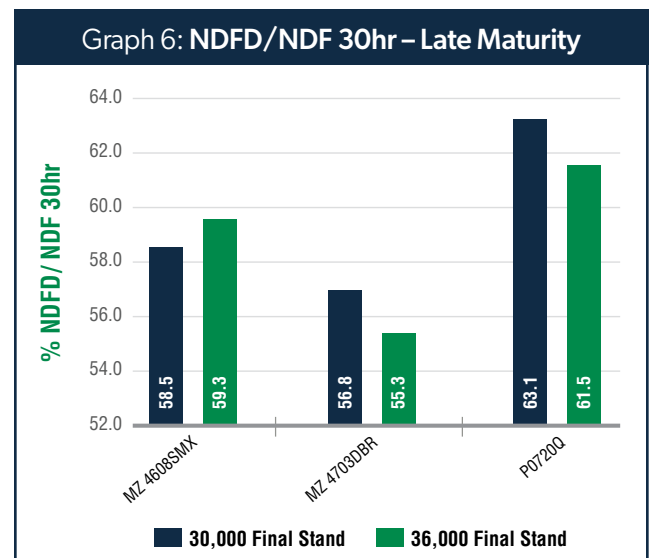
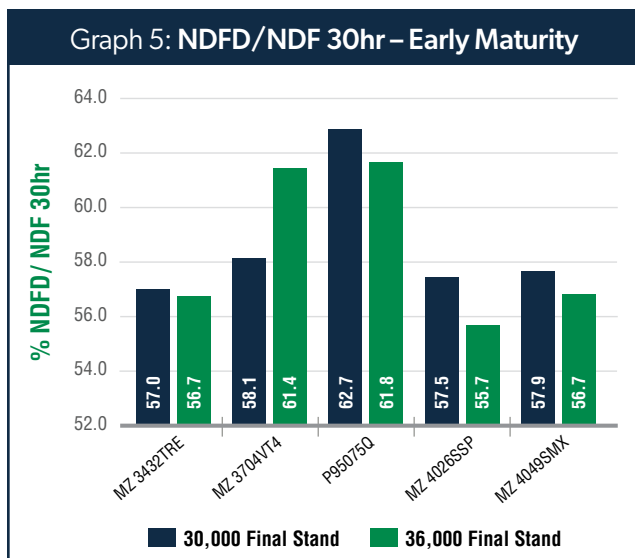


Fibre Digestibility

To compare fibre digestibility between hybrids and populations, we used the %NDFD/NDF 30-hour NIR test conducted at an accredited laboratory.

As expected, increasing population tended to slightly reduce fibre digestibility. However, the decline was relatively minor. We suspect the strong soil profile at the Embro site and consistent growing conditions allowed the crop to sustain higher populations with limited physiological stress.

At elevated populations, plants typically produce more stalk and rind tissue and proportionally less pith. This structural shift often increases lignin concentration, which in turn reduces digestibility. Nevertheless, the reduction observed in 2025 was modest and did not outweigh the yield benefits.

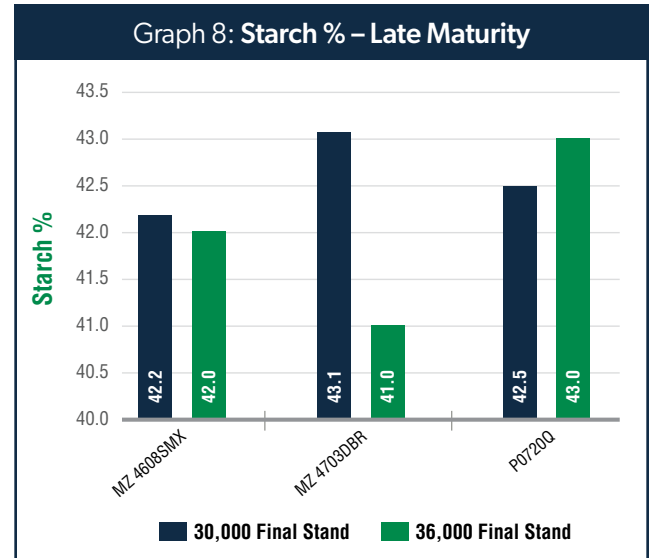
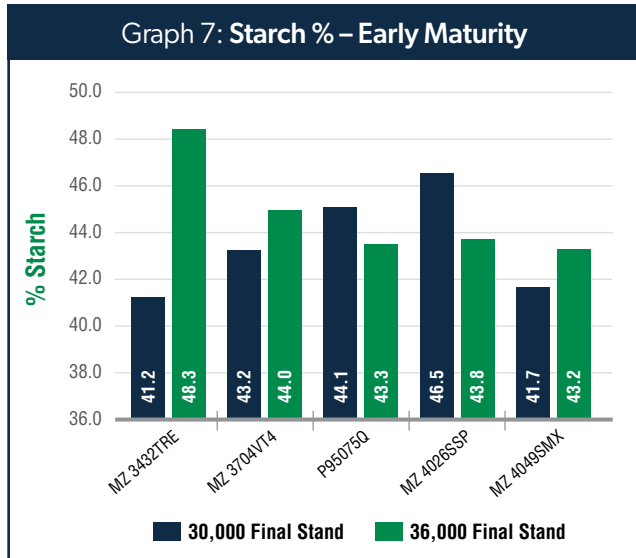


Starch Content

Starch levels in 2025 were above average, ranging from 41% to 48%. Some hybrid-specific responses were observed.

Generally, we expect slightly higher starch concentrations at increased populations due to more ears per acre and less variability in kernel mass prior to black layer. Early-maturity hybrids recorded the highest starch levels, averaging below 60% harvest moisture. In contrast, late-maturity hybrids averaged in the mid- to low-60% moisture range, which aligned well with optimal harvest timing.

These results indicate that harvest maturity was well targeted, contributing to strong starch accumulation across treatments.



Going Forward

We strongly recommend careful attention to planting populations in corn silage production. Each field and each hybrid have an optimal population based on soil type, fertility level, and moisture-holding capacity. Maximizing both tonnage and milk per acre is critical to improving overall farm profitability.

We also continue to advocate for a VT-R1 fungicide application in silage systems, given the consistent return on investment in both yield and quality metrics.

Corn silage management is often overlooked relative to grain production. However, with a few strategic adjustments, particularly around population management and plant health, producers can achieve higher yields and more consistent feed quality, benefiting livestock performance throughout the following year.

Acknowledgements

This article was written by Adam Parker CCA-ON, Regional Manager of Ontario at Maizex.

The Sulfur Story in Soybeans

Background

In 2025, Maizex continued research into sulfur and its interaction with soybeans, building on two previous seasons of in-house research. Interest in this area was driven by Dr. Shaun Casteel of Purdue University. Dr. Casteel first worked on interactions between early-season, pre-plant, or early post-plant broadcast sulfur fertilizer on soybeans. He had several locations that continually showed positive response to sulfur, especially when coupled with early planting. Last season, two of the four locations planted by Maizex showed positive responses to broadcast sulfur fertilizer, namely Tupperville and Simcoe, ON.

This season, locations were planted in St. Célestin and St. Hyacinthe in Quebec and Inkerman, Embro, Simcoe, and Tupperville in Ontario. Sulfur has proven to be a key component in aiding early nodulation in soybeans, improving not just sulfur levels but also nitrogen levels in the crop. We have also seen positive interactions between sulfur and the presence of SCN. When SCN is present, sulfur appears to aid root development, increasing the likelihood of response.

According to data compiled by Horst Bohner from 2019–2025 across 49 locations, there has been a 3.1 bu/ac response to sulfur in Ontario. However, 22% of those locations were very responsive, averaging 10.3 bu/ac, with some sites reaching upwards of 30 bu/ac. This included the Maizex site in Simcoe in 2024. Further understanding of where and when sulfur responses are expected continues to drive soybean research in Ontario.

How We Did It

ONTARIO TRIALS

Embro and Inkerman

- 2 varieties: Forge XF and Viper R2X
- 100 lbs AMS at planting
- 100 lbs SUL4R-Plus at planting
- 100 lbs PurYield1 at planting
- 100 lbs PurYield + AMS at planting
- 100 lbs AMS at planting + R3–R4 fungicide
- Fungicide at R3–R4
- Control

Tupperville and Simcoe

- 2 varieties: Lynx E3 and Ocelot E3
- 100 lbs AMS at planting
- 100 lbs SUL4R-Plus at planting
- 200 lbs AMS at planting
- 100 lbs PurYield + AMS at planting
- 100 lbs AMS + PurYield1 at planting + R3–R4 fungicide
- Fungicide at R3–R4
- Control

QUEBEC TRIALS

St. Célestin and St. Hyacinthe

- Varieties: Grizzly R2X & Viper R2X at St. Célestin; Viper R2X & Forge XF at St. Hyacinthe
- 100 lbs AMS at planting
- 100 lbs AMS at planting + R3–R4 fungicide
- 100 lbs AMS + PurYield1 at planting + R3–R4 fungicide
- Fungicide at R3–R4
- Control

Results

Yield

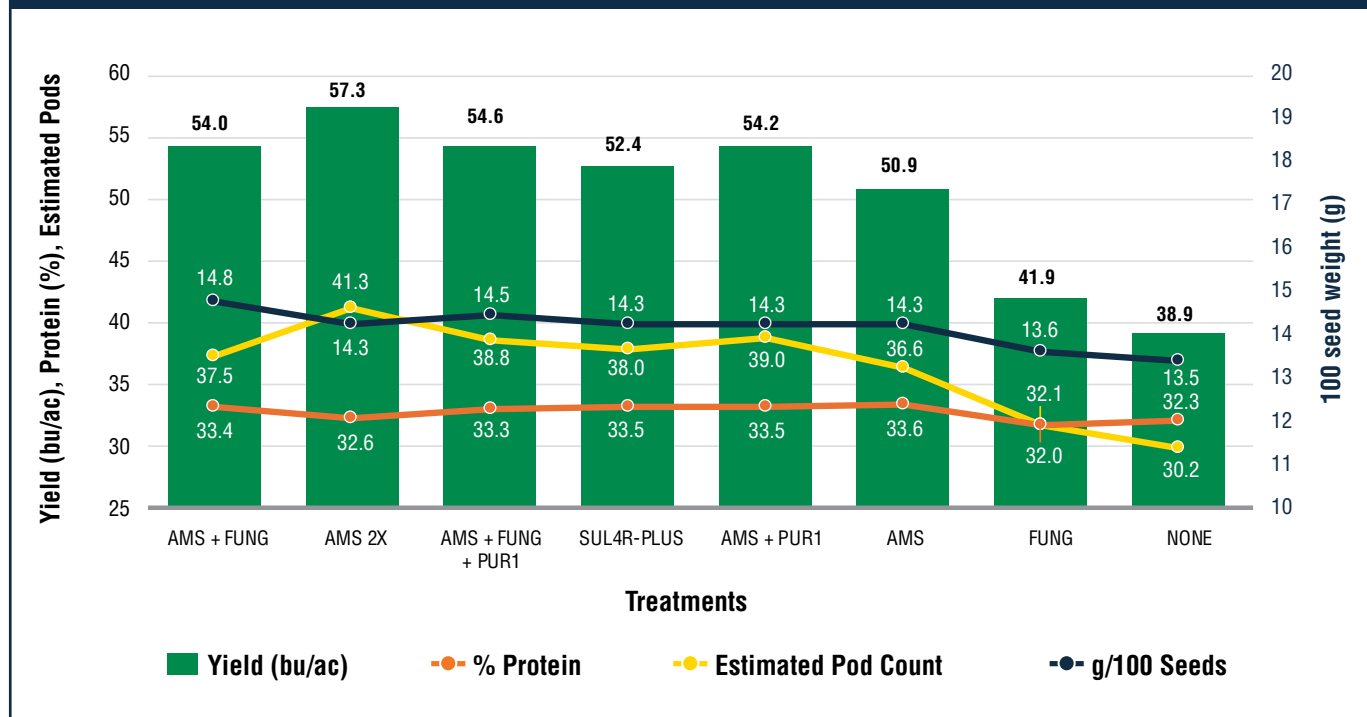
Results were largely consistent with previous years. However, a few challenges affected the season. Drought in Eastern Ontario made our Inkerman site a write-off, and it was not harvested. In Tupperville, a harvesting error resulted in the entire plot being harvested instead of treated rows, making yield results unreliable. However, in-season tissue testing was completed and allows us to predict likely response at that location.

In Simcoe, we once again saw a 12 bu/ac response to sulfur, and an additional 3.7 bu/ac, for a total of 15.7 bu/ac response with the fully loaded treatment of AMS + PurYield + fungicide. In 2025, we also saw strong results from SUL4R-Plus, a pelletized controlled-release gypsum, which slightly edged out AMS but was not statistically higher yielding. Because this product only contains sulfur and calcium, we can confirm the response was from sulfur rather than nitrogen.

Table 1. **Economics of Treatments in Simcoe**

Treatment	Yield (bu/ac)	Gross revenue (\$14.50/bu)	Treatment Cost / Acre	Net Revenue / Acre	Advantage / Acre over Standard
Control	38.9	\$564.05	\$0.00	\$564.05	\$0.00
Fungicide	41.9	\$607.55	\$30.50	\$577.05	\$13.00
AMS	50.9	\$738.05	\$40.00	\$698.05	\$134.00
AMS + PurYield	54.2	\$785.90	\$91.15	\$694.75	\$130.70
SUL4R-PLUS	52.4	\$759.80	\$31.80	\$728.00	\$163.95
AMS 2X (200 lbs)	57.3	\$830.85	\$80.00	\$750.85	\$186.80
AMS + Fungicide	54.0	\$783.00	\$70.50	\$712.50	\$148.45
AMS + PurYield + Fungicide (Full Package)	54.6	\$791.70	\$121.65	\$670.05	\$106.00

Graph 1: Sulfur Soybeans - Simcoe, Ontario



A new 2025 treatment, 200 lbs AMS at planting, produced the highest overall response at Simcoe, yielding 57.3 bu/ac, a full 18.4 bu/ac better than the control. Tissue testing in Tupperville showed improvements of 3:1 to 4:1 in the N:S ratio, suggesting likely response despite the lack of yield data.

At Embro, we saw little change in N:S ratio and minimal yield response. This was expected as Embro is a fertile loam soil on a dairy farm with high organic matter—not a site that would typically be considered responsive to sulfur. In Quebec, we saw little benefit to sulfur but a strong response to fungicide, which is common due to frequent white mold pressure.

Yield Components and Protein

In 2025, we again observed a bump in protein levels when sulfur was applied. Where yield response occurred, protein increased by roughly 1.2% (see Graph 1). Since sulfur is a key component of protein, this may be valuable for IP soybean production where higher protein improves premium opportunities.

Yield component analysis showed that, where sulfur increased yield, there was also an improvement in seed weight and pod count. Seed weight improved by about 1 gram per 100 seeds (see Graph 1). Estimated pod count, which is calculated using $\text{Yield} / \text{Population} / 2.2 \text{ seeds per pod}$, increased by approximately 4–6 pods per plant across sulfur treatments and up to 9 pods per plant in the 200 lbs AMS treatment (see Graph 1). This likely reflects both increased podding and more node podding from improved early growth.



Trial from Simcoe, ON, July 8, 2025.

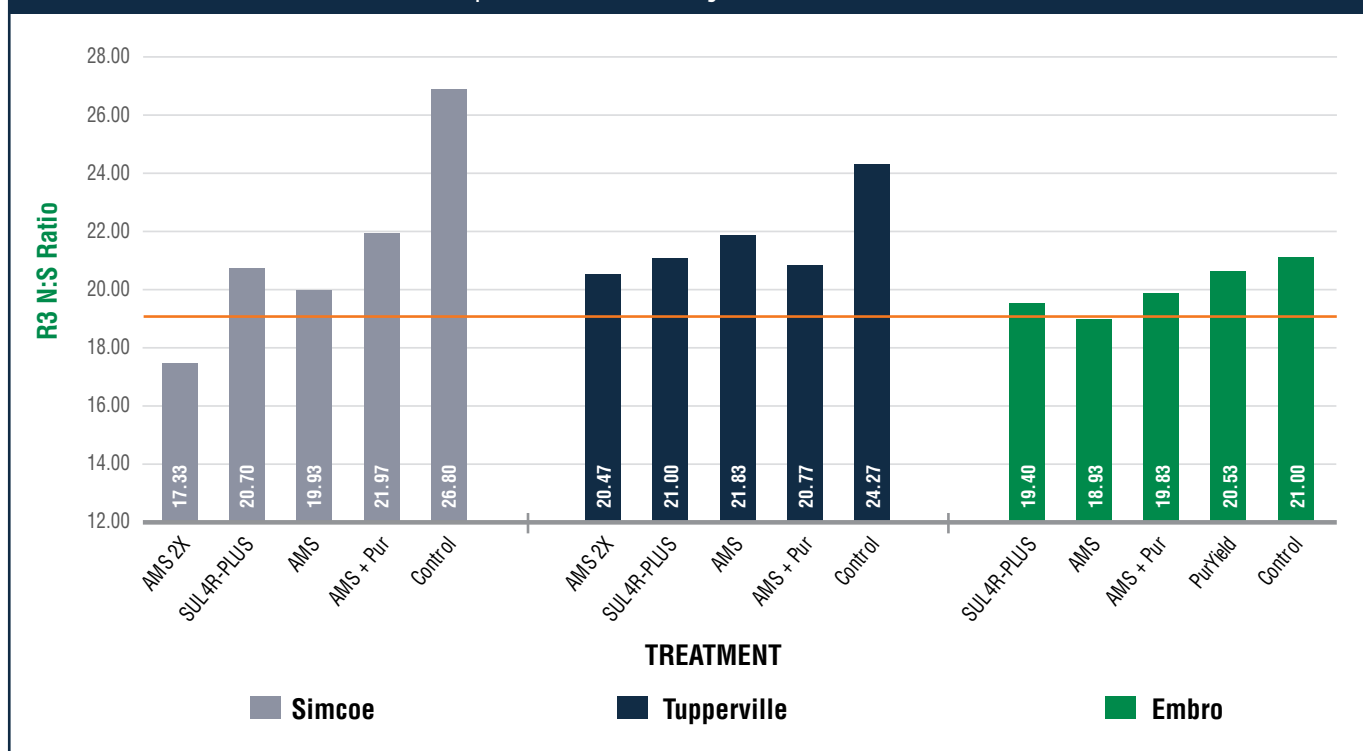


Trial from Simcoe, ON, July 8, 2025.

Table 2. **2025 Yield Response by Location**

Treatment	St. Hyacinthe Yield (Bu/ac)	St. Célestin Yield (Bu/ac)	Embro Yield (Bu/ac)	Average Yield (Bu/ac)
AMS	66.37	72.67	66.17	68.40
AMS + FUNG	63.02	78.36	71.57	70.98
AMS + FUNG + PUR1	65.20	76.90	65.76	69.29
FUNG	66.74	76.00	67.81	70.18
SUL4R-PLUS	-	-	66.62	-
PurYield	-	-	70.61	-
AMS + PurYield	-	-	68.35	-
None	66.73	71.09	66.93	68.25

Graph 2: N:S Ratio By Treatment 2025



Sulfur: the Key Takeaways

There was once again a strong response at Simcoe, a sandy loam site with 10–12 CEC and heavy SCN pressure. When examining where sulfur responses are most predictable, the following conditions increase likelihood:

1. Light-textured sandy soils with lower CEC
2. SCN pressure
3. No history of livestock manure or organic amendments
4. Early planting (limited early sulfur mineralization)
5. High C:S ratio scenarios (corn stalks, rye cover crops, etc.)
6. Lack of sulfur in the crop rotation
7. Previous soybean tissue tests with N:S ratios above 20:1

Horst Bohner’s broader dataset suggests roughly 1 in 5 sites (20%) will respond to sulfur. As margins tighten in 2026, prioritizing acres most likely to respond will be critical. Tissue testing at R3 using the newest fully formed trifoliolate can help identify responsive fields. N:S ratios above 18:1 (Casteel threshold) or above 20:1 (Maizex threshold) suggest likely response, though late applications are not recommended as early sulfur drives nodulation and yield potential.

Going Forward

After three successful seasons with the current protocol, we plan to evolve trials into a more intensive soybean management system. AMS will remain a standalone treatment, but we will also explore phosphorus management based on research from Horst Bohner and Adrian Correndo at the University of Guelph. Trials and strip plots will continue to examine soybean yield components.

In conclusion, Maizex has seen strong evidence that many farms in Ontario can benefit from sulfur in soybeans. Sulfur is expected to become a key pillar in maximizing yields for progressive soybean growers across the province.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

Optimal Soybean Population

Background

Over the past few decades, average soybean planting populations have steadily declined across North America. According to the USDA, average seeding rates exceeded 200,000 seeds per acre in 1997. By 2002, that number dropped to approximately 192,000 seeds per acre and continued to decline to roughly 157,000 by 2018. Current estimates suggest most soybean acres are planted between 147,000 and 152,000 seeds per acre, a decline of roughly 2,000 seeds per acre per year.

This shift reflects not only a better understanding of soybean plasticity but also improvements in genetics, planter technology and accuracy, and agronomic management. Within the averages, soybean seeding rates are influenced by many factors including planting method (planter vs. drill), soil type, row width, tillage system, planting date, variety selection, herbicide trait platform, seed cost, and seed treatments.

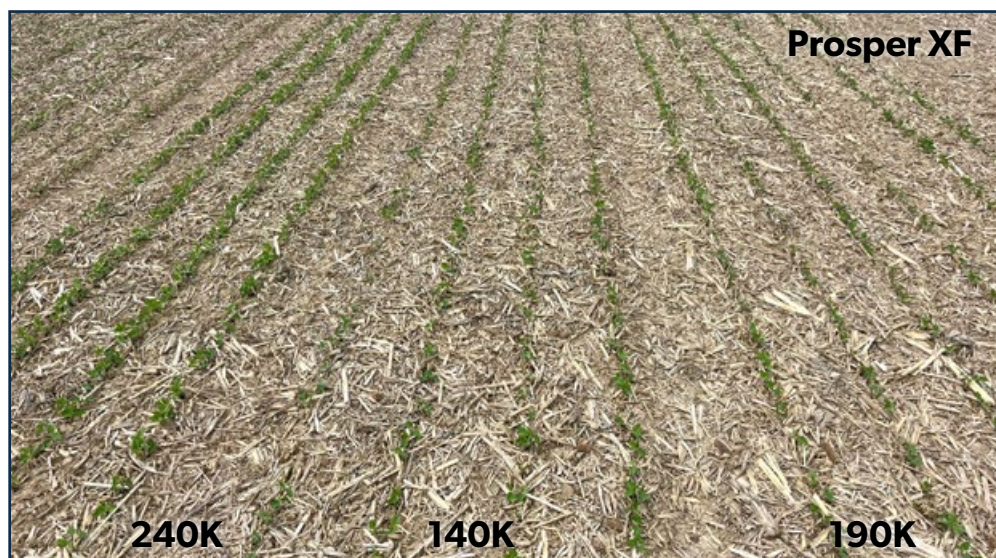
The recent adoption of variable rate seeding (VRS) technology has renewed interest in identifying optimal soybean populations by yield environment. Unlike corn, soybeans often benefit from *lower* seeding rates in high-productivity areas and *higher* seeding rates in lower-productivity zones. The underlying principle is node production per acre.

In lower-yield environments, due to soil limitations, fertility constraints, or moisture stress, soybeans often struggle to branch and maximize vegetative growth. Increasing seeding rates in these environments increases the plant count per acre, which in turn increases total node and pod potential. Conversely, in high-yield environments, excessive populations can lead to lodging and increased inter-plant competition. This often results in elongated internodes, reduced branching, and ultimately fewer total nodes compared to lower populations where individual plants are able to fully express their architecture.

What We Did in 2025

In 2025, population response trials were conducted at multiple locations across Canada, including Jarvis, ON; St. Célestin, QC; and Oakville, MB. Several new and experimental soybean varieties were planted at multiple seeding rates to evaluate optimal population, varietal response, and consistency across environments.

Seeding rates were selected based on local soil type and regional norms. At all locations except Jarvis, populations of 100,000, 140,000, and 180,000 seeds per acre were planted on 15-inch rows. At Jarvis, populations were increased to 140,000, 190,000, and 240,000 seeds per acre, also on 15-inch rows.



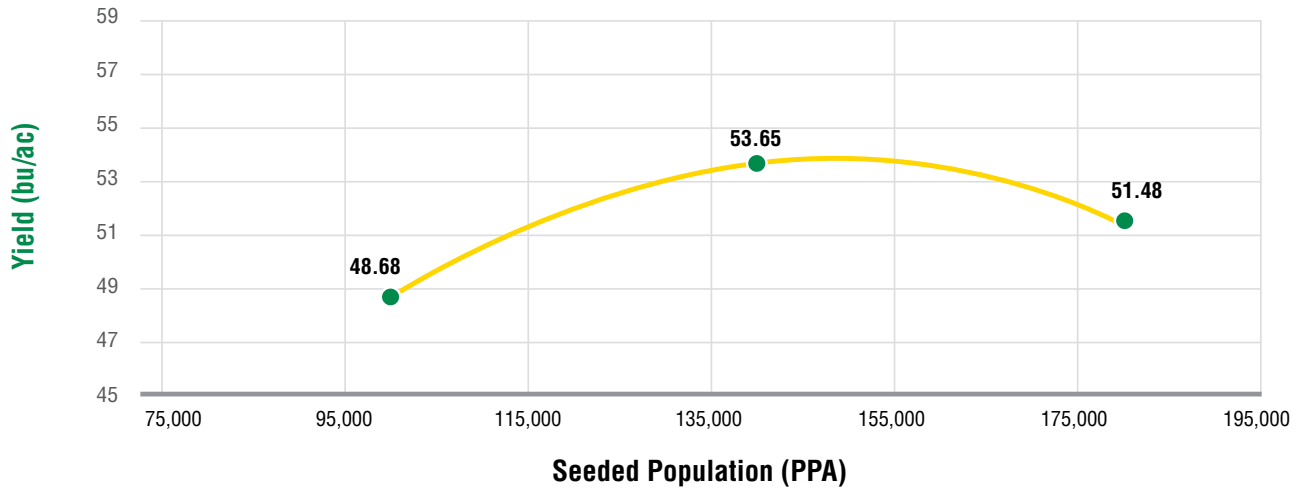
Different populations clearly evident after emergence in the Jarvis, ON, trial.

The objective of these trials was twofold:

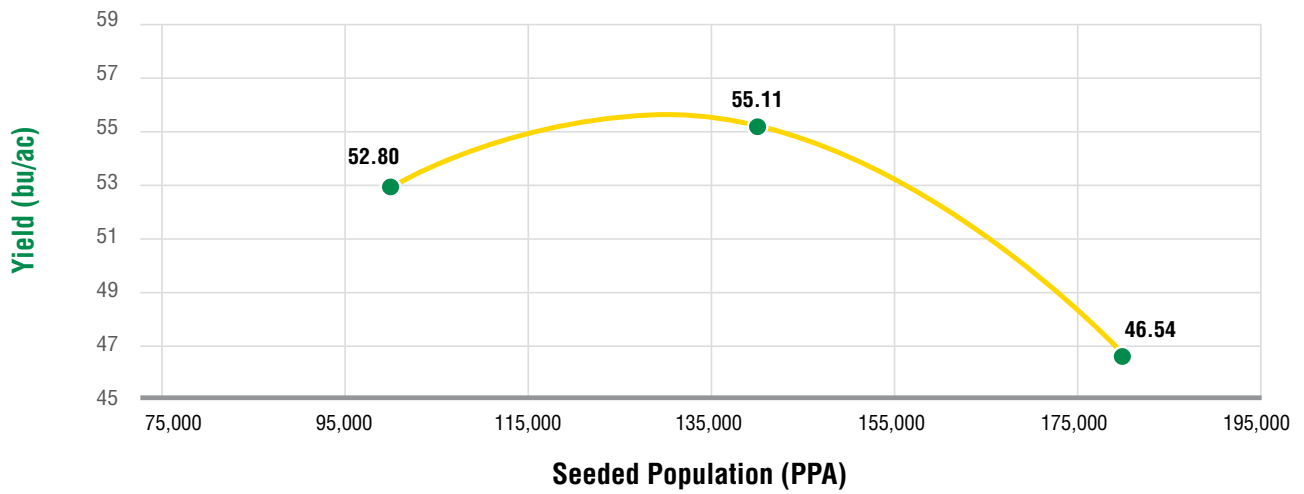
1. To determine optimal populations for individual varieties.
2. To further characterize new genetics based on population response.

As expected, varieties with smaller, narrower statures generally responded more positively to increased populations than large, heavily branched types.

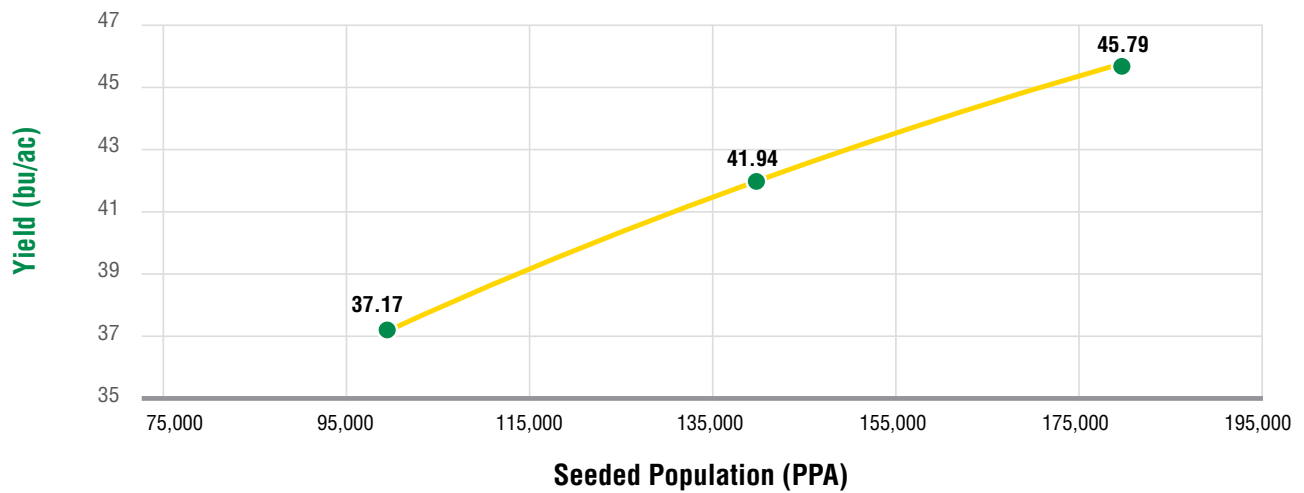
Graph 1: St. Célestin | 8 Varieties



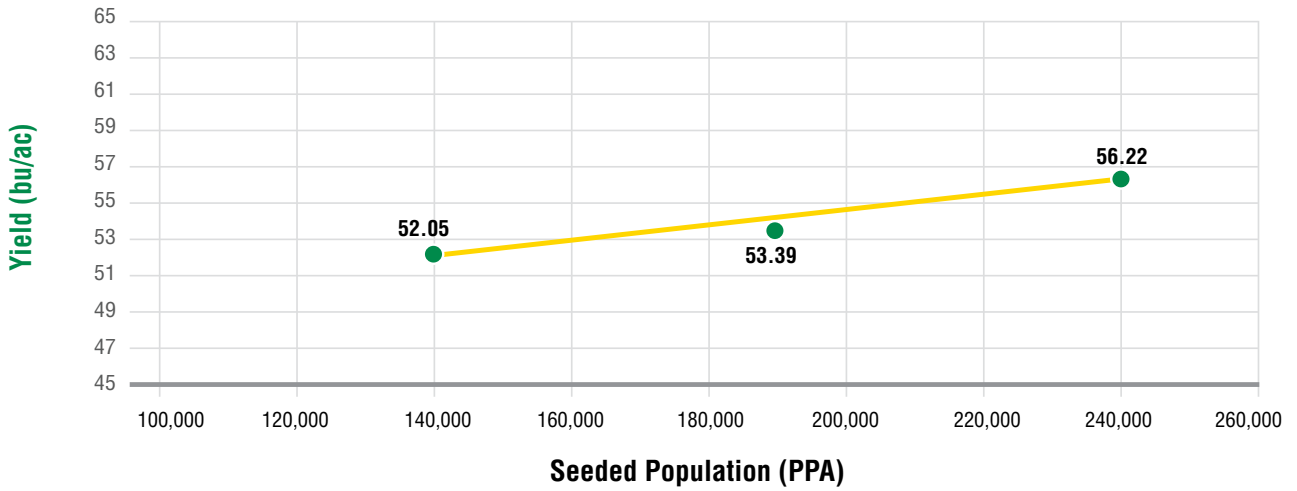
Graph 2: St. Célestin | Hulk R2X



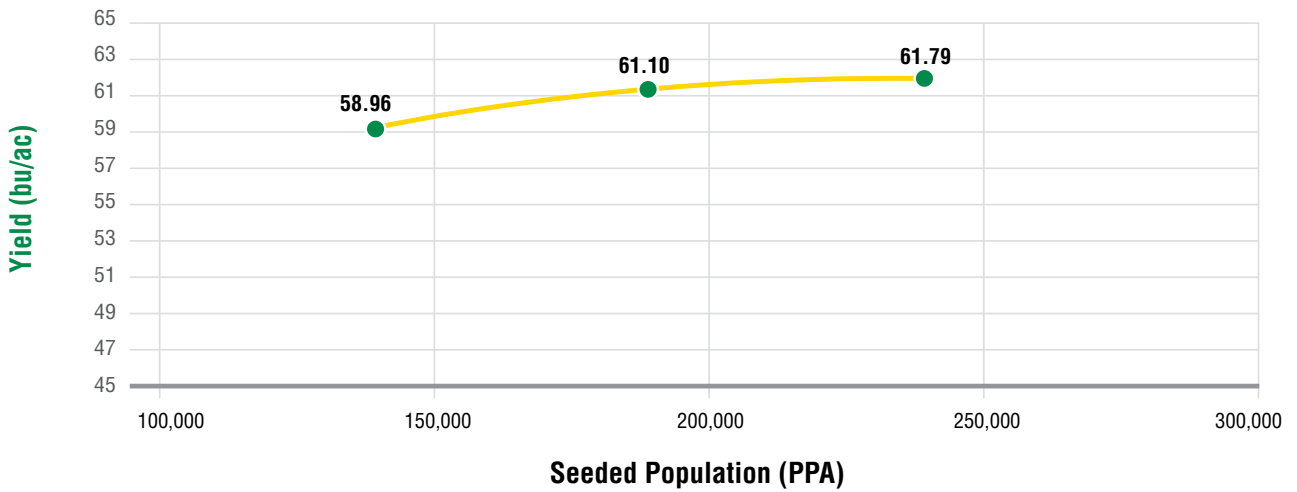
Graph 3: St. Célestin | Polar R2X



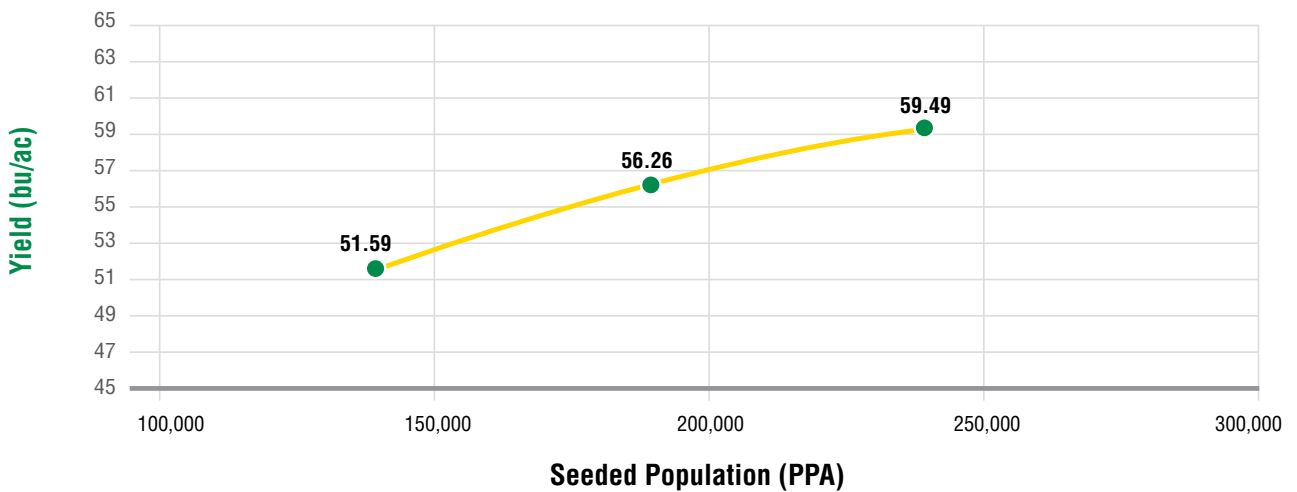
Graph 4: Jarvis | 8 Varieties



Graph 5: Jarvis | Prosper XF



Graph 6: Jarvis | Striker E3



Results

As anticipated, varieties responded differently to population. In most trials, some varieties showed yield penalties at higher populations, while others never reached a population high enough to reduce yield. At the Jarvis site, a very heavy Haldimand clay soil, none of the eight tested varieties yielded less at 240,000 seeds per acre compared to 140,000 or 190,000. However, some varieties showed such minimal yield response that higher populations were economically unjustifiable.

At St. Célestin, QC, the optimal population across varieties was 140,000 seeds per acre. With emergence rates ranging from 85–95%, final stands averaged approximately 125,000 plants per acre at this population. *Graph 1* illustrates the overall yield response of eight varieties to population at this site.

St. Célestin, similar to locations in Eastern Ontario, historically experiences significant white mold and disease pressure. This often means higher yields at slightly lower populations when compared to regions where disease pressure is less severe.

Varietal differences were particularly evident. *Graph 2* shows Hulk R2X (00.8 RM), a large-stature soybean with average standability, which exhibited a slight yield increase at 140,000 seeds per acre but a significant yield decline at 180,000. In contrast, Polar R2X (00.1 RM) demonstrated a linear yield response to population (*Graph 3*). In this case, populations should have been pushed higher, as yield continued to increase.

This response is not surprising. Polar R2X is below the adapted maturity for the area and has a small, narrow canopy. Similar to double-cropping systems, increasing population can help offset yield penalties associated with early-maturity soybeans by increasing node density. Early-maturing varieties have shorter vegetative and reproductive phases, making population an effective tool to increase yield potential.

At Jarvis, ON, populations of 140,000, 190,000, and 240,000 seeds per acre were seeded, with emergence averaging approximately 90%. Final stands were roughly 125,000, 170,000, and 215,000 plants per acre, respectively. Most varieties exhibited a linear yield response to population, although a few showed yield plateaus at the highest rate. The cumulative yield response is shown in *Graph 4*.

Overall, yields increased by approximately 2 bushels per acre for every additional 50,000 seeds in a season that was shortened and limited by moisture stress. At a seed cost of \$75 per 140,000-seed unit, the added cost was \$27 per acre. This roughly offsets a 2-bushel yield gain at \$13.50 soybeans; however, under improved moisture conditions or stronger crusher prices, the return would be more positive.

Again, varietal response varied significantly. *Graph 5* shows Prosper XF (2.7 RM), a large, bushy soybean similar in stature to Hulk R2X. This variety exhibited minimal yield response, gaining only 0.7 bu/ac from 190,000 to 240,000 seeds per acre, suggesting an optimal population slightly above 190,000.

In contrast, *Graph 6* highlights Striker E3 (2.7 RM), which was highly responsive to population. Yield increased nearly 5 bu/ac moving from 140,000 to 190,000 seeds and an additional 3.2 bu/ac from 190,000 to 240,000—both economically positive responses. Despite being longer than adapted in maturity for the area, the smaller, narrower stature of Striker E3 allowed it to continue increasing node counts at higher populations.

It is also worth noting that harvesting was easier at higher populations due to increased first-pod height, which likely contributed to improved yield capture.

Moving Forward and Application

Maizex will continue population response trials across multiple locations and soil types in 2026. These trials will help refine varietal recommendations for optimal seeding rates, standability, and disease management.

One clear takeaway is that lower seeding rates are not always better in soybeans. Population decisions must be adjusted based on environment including disease risk, genetics, and management.

As a general guideline:

- 155,000 seeds per acre on excellent soils using a 15-inch planter is a solid base rate
- For 20–30 inch rows, populations can be reduced by 10–15% (≈130,000–140,000)
- Switching from a planter to a drill typically warrants a 10–15% increase (≈175,000 on 15-inch rows)
- Moving to 7.5-inch rows with a drill may require an additional 10% seeding rate, bringing populations near 190,000–200,000

Soil type and tillage should also be considered. In no-till systems, a 10% increase is often justified. Similarly, heavy clay soils may require higher populations to compensate for reduced vegetative growth and emergence challenges.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds.

Rethinking Replant Decisions

Background

When looking at soybeans, there is no definitive number when it comes to the ideal population. Soybean populations can often be adjusted downward, for example, to account for greater vegetative growth and increased node development in loamy soils with high yield potential and fertility. Lower planting populations can also improve standability and reduce the risk of white mould in these situations. Increased light penetration lower in the canopy typically results in a higher number of pods per node and, therefore, more pods per plant. Together, these factors have supported the trend toward lower soybean planting populations across North America.

However, what does this mean for replant decisions? In 2025, cool, wet weather combined with early planting windows resulted in some fields with stands below 100,000

plants per acre (PPA), forcing difficult decisions on whether to fully replant, thicken the stand, or leave a below-optimal population. Replant decisions must consider multiple factors, with planting date being one of the most critical. In Ontario, soybean yields are typically maximized within the April 20th – May 10th planting window. Planting in mid-May (May 10th – May 20th) generally results in only minor yield loss of approximately 1–2%. However, once planting moves into late May and early June, yield penalties increase significantly, averaging about 0.3 bu/ac per day or roughly 8–10% less than timely planting. The objective of this trial was to evaluate yield responses to thickening an existing thin stand, applying nitrogen to low populations, and fully replanting.

How It Was Done

Soybeans were planted on May 19th at Embro, ON, just prior to a cold spell that brought excessive moisture. The trial was established on 15" rows at 140,000 PPA in a highly fertile loam soil on a dairy farm. The field was planted into a burned-down rye cover crop and experienced poor emergence due to a combination of planting depth variability, cool weather, and seed corn maggot pressure.

The resulting lack of uniform emergence led to significant stand variability. Given reduced populations, the original plot plan was abandoned and modified on the fly into a replant consideration trial. The project was led by Horst Bohner, OMAFA soybean specialist. The following treatments were established with five replications each:

1. 30,000 PPA
2. 30,000 PPA + 110 lbs/ac urea
3. 30,000 PPA + replant to 140,000 PPA
4. 60,000 PPA
5. 60,000 PPA + 110 lbs/ac urea
6. 60,000 PPA + replant to 140,000 PPA
7. 90,000 PPA
8. 90,000 PPA + 110 lbs/ac urea
9. 90,000 PPA + replant to 140,000 PPA
10. Full replant at 210,000 PPA

Notes:

Treatments 3, 6, and 9 maintained the original stand and were inter-seeded to increase population. Treatment 10 involved complete destruction of the original stand prior to replanting.

Historically, OMAFA recommendations suggest that 90,000 PPA is generally sufficient in high-fertility loam soils, while stands below this threshold are typically considered for replant. Replanting occurred on June 23rd using Viper R2X (0.9 RM), the same variety used in the original planting.

Results & Discussion

When looking at *Graph 1*, it is very evident that destroying the original stand and starting entirely over was a poor decision in a field where fertility and soil type allow for exceptional plant growth. The full replant treatment yielded 54.1 bu/ac, a solid yield in most circumstances, but considering that all other treatments exceeded it, this approach was clearly not the answer. Even the original stand at 30,000 PPA outperformed it, yielding 58.0 bu/ac.

Statistically, all treatments at 60,000 PPA and 90,000 PPA were equal and ahead of all 30,000 PPA treatments and the complete replant, which were also statistically equal among themselves (see *Graph 1* with A and B groups respectively). The addition of nitrogen (50 lbs/ac actual N applied as 110 lbs/ac broadcast urea) did not provide any significant yield response, even at the extremely low populations of 30,000 and 60,000 PPA. This is not entirely surprising given the farm's history of dairy manure applications and high organic matter levels, which likely contributed to substantial soil nitrogen mineralization.

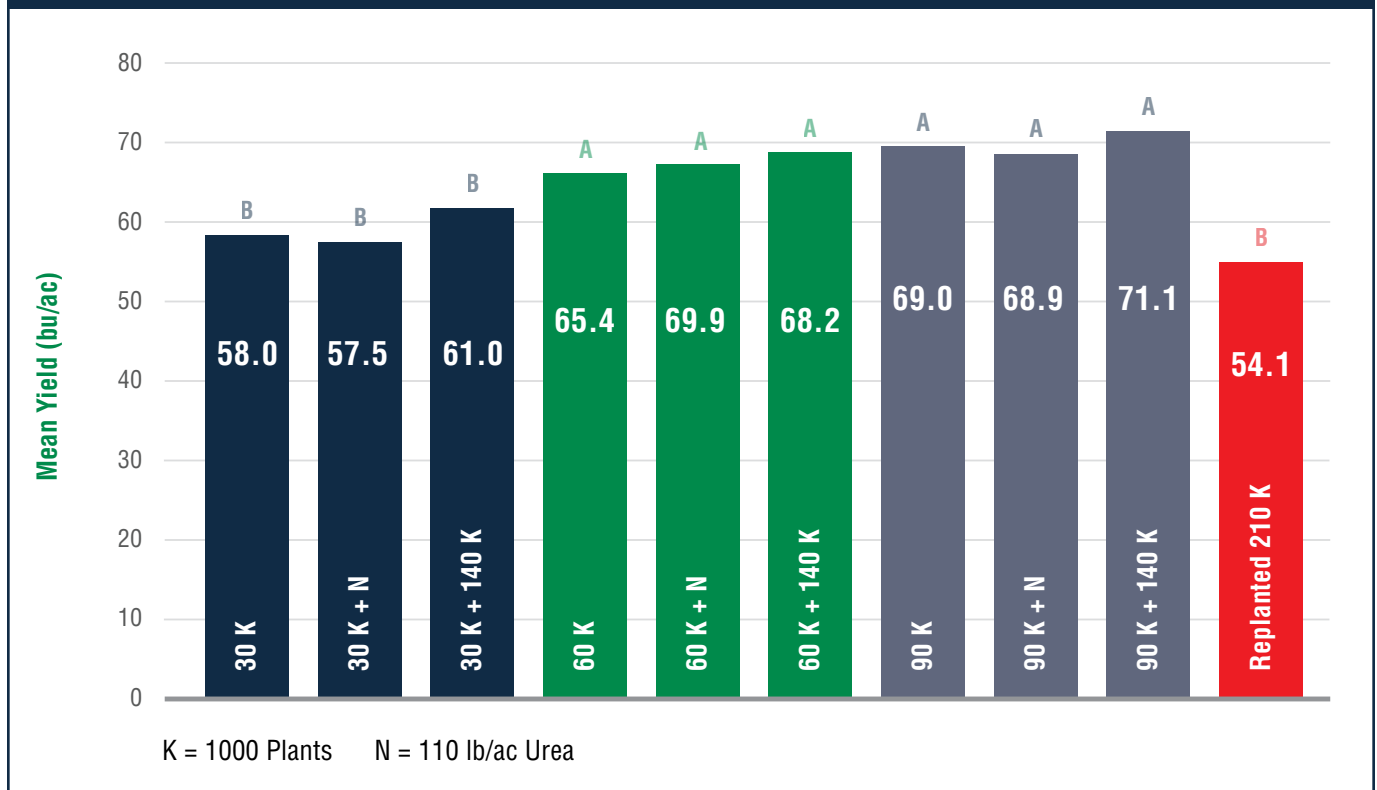
What was even more interesting was how little the thickened stands contributed to overall yield. Treatments thickened by replanting to 140,000 PPA yielded, on average, only

2.63 bu/ac more than the stand-alone treatments. While the replanted plants clearly contributed some yield, their impact was significantly less than that of the original plants. It was also evident that adding new plants reduced the per-plant productivity of the original stand compared to when it was left alone.

Research from soybean specialist Dr. Shaun Casteel at Purdue University reflects similar findings, suggesting that thickening stands of 70,000 PPA or more rarely increases yield but often adds risk and cost associated with replanting. His research also supports the limited contribution that replanted soybeans bring to total yield. Casteel's data showed that new plants contributed only about 5% of total yield when replanted after the original stand reached V2. In most cases, his work suggests that replanting is most effective when:

- original stands fall below 50,000–60,000 PPA
- the replant occurs early before the original reaches V2 (when they are deciding whether to branch or not), and
- more ideally, these replants occur in May or very early June.

Graph 1: Patched and Replanted on June 23



Moving Forward

Similar to Dr. Casteel's observations, highly fertile loamy fields with early planting and stands at or above 70,000 PPA can often achieve yields equal to or greater than what would result from replanting or thickening a stand. Thus, in Ontario, we too should consider leaving stands at or above 70,000 PPA where the scenario makes sense. However, these recommendations are specific to fertile loam soils; adjustments are necessary for each farm, soil type, and scenario.

It is important to consider all factors when replanting. In contrast to above, work in heavy clay soils in Essex, Lambton, Haldimand, and Niagara shows that weak or uneven stands below 120,000 PPA often respond positively to replants at 140,000 PPA or higher, depending on the original stand. In 2023, a Haldimand field with an average stand of 115,000 PPA was replanted at 180,000 PPA on an angle to the original 15 rows, while stronger areas were left untouched. At harvest, the replanted sections yielded nearly 15 bu/ac more than the untouched portions, highlighting how replant response varies by soil type and environment.

Fields where branching and vegetative growth are limited due to soil type or fertility are more likely to respond to replant, as the original stand cannot compensate through increased node development or branching. Whereas fields where high soybean yields are often achieved, mould and lodging are sometimes issues. In these situations where fertility and soil type do not restrict growth, stands of 60,000–70,000 PPA are likely sufficient to maximize yield in that given year in comparison to thickened stands or entirely replanted stands.

Acknowledgements

This article was written by Henry Prinzen CCA-ON, Ontario Agronomy Lead, Maizex Seeds. A special thank you to OMAFA Soybean Specialist Horst Bohner for completing the trial work and summarizing the data.



A 'patched' row in the Embro, ON, trial, September 22, 2025. These plants could not compete, even with the very thin stands.



A plant from a 'patched' row in the Embro, ON, trial, showing virtually no pods, September 22, 2025.

DOUBLE-CROPPING:

Are ultra-early soybean varieties the key to successful double-crop soybeans in short-season areas?

Background

In areas with fewer than 2,800 crop heat units (CHUs), the greatest challenge with double-crop soybeans is achieving maturity before a killing frost. Ultra-early (very low maturity group) varieties offer the best chance of success under these short-season conditions.

Interest in double-cropping soybeans after winter cereals continues to grow across Ontario, even in regions with less than 2,800 CHUs. While dry conditions at mid-summer planting can hinder establishment, the primary risk remains frost before the crop reaches full maturity.

If a killing frost occurs before plants reach at least the R6 growth stage (full seed), the crop is typically not worth harvesting. For this reason, variety selection is critical.

How It Was Done

Ultra-early maturity group (MG) varieties, including 000 and 00 types, are now available that were not widely accessible in past decades. To evaluate their suitability for double-crop systems, a field trial was conducted at the Elora Research Station in 2025. Elora is considered a 0.7 MG area, making it a good test location for extremely short-season genetics planted in July (July 11, 2025).

Table 1: **Double-Cropping Soybean Yield (Elora 2025)**

Hybrid	Row Width (in)	Seeding Rate (X1000)	Yield (bu/ac)	Row Width Average (bu/ac)	Gross Profit (\$/ac)
Wolf R2X 000.7 MG 2200 CHU	7.5	210	42.4	44.3	\$492.35
	7.5	350	46.1		
	15	210	44.5	42.8	\$470.60
	15	350	41.0		
Badger R2X 00.6 MG 2425 CHU	7.5	210	42.4	44.3	\$492.35
	7.5	350	46.1		
	15	210	44.5	42.8	\$470.60
	15	350	41.0		
Hydro R2X 0.1 MG 2550 CHU	7.5	210	42.4	44.3	\$492.35
	7.5	350	46.1		
	15	210	44.5	42.8	\$470.60
	15	350	41.0		

Gross profit assumes a selling price of \$14.50/bu and a seed cost of \$75.00 per bag. The planting date was July 11, 2025.

Results and Discussion

Double-crop yields were surprisingly high at this site in 2025. A dry fall with a late frost (October 9th) contributed to this success. Seed quality was acceptable for all three varieties tested, but the lowest MG variety (000.7) had the best seed quality and overall yield. The results provide strong evidence that, in short-season environments, varieties up to three full maturity groups earlier than locally adapted varieties may be required for double-cropping success.

The Importance of High Seeding Rates

Soybeans planted in July remain physically shorter and produce fewer nodes compared to May-seeded crops. With fewer nodes per plant, yield potential per individual plant declines. The only practical way to compensate is to increase plant population. Because the growing season is compressed in double-crop systems, plants have less time to grow tall, and the risk of lodging is low. This allows for higher seeding rates without the typical standability concerns seen in full-season soybeans.

This trial clearly demonstrated that very high seeding rates are necessary to maximize yield and profitability.

At \$75 per bag seed cost and \$14.50 per bushel soybean price, the most profitable seeding rate in this study was 263,000 seeds per acre (see *Graph 1*).

Moving Forward

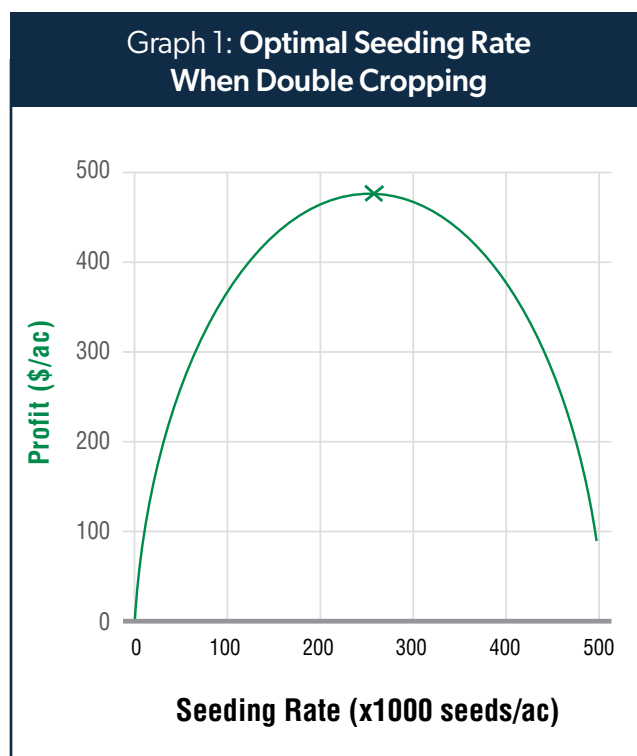
1. Frost risk is the primary limitation to double-cropping success.
2. Ultra-early maturity groups (000 or 00) significantly reduce that risk, especially in short-season areas.
3. The lowest MG variety yielded the highest and had the best seed quality.
4. High seeding rates are essential to compensate for reduced plant size and node number.
5. In 2025 at Elora, the combination of ultra-early genetics and high population produced excellent yields and strong profitability.

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Double-crop Wolf R2X harvest sample from Elora, ON.



Note: The “profit” noted above is calculated based on the cost of seed versus yield and does not include land or other input costs.

Recipe Approach

Background

Soybean growers are increasingly interested in identifying a practical “recipe” that can be applied across a range of soil types and field conditions to improve returns. Most field research isolates individual inputs or management practices to measure their independent yield response. While this approach is essential for understanding the contribution of each factor, it does not fully capture the potential interaction among multiple strategies applied together.

The objective of this study was not to apply a ‘kitchen sink’ strategy aimed solely at maximum yield but rather to evaluate whether a reasonable combination of proven practices could consistently improve yield and, more importantly, profitability.

How We Did It

Ontario research has consistently shown that planting a slightly longer maturity (higher maturity group) soybean variety early can increase yield potential. In this study, two checks were included:

- An **adapted-maturity** variety planted in the normal window
- A **longer-maturity** variety planted in the normal window

The enhanced “recipe” treatment included:

- Early planting (April 25)
- A longer-maturity variety
- Starter fertilizer broadcast at planting:
 - 40 lb/ac MAP (11-52-0)
 - 100 lb/ac dry AMS (21-0-0-24S)
- One foliar fungicide application (Delaro Complete at R2.5)

The starter fertilizers were selected to stimulate early root development, vegetative growth, and nodulation. Sulfur (S) has been shown to improve soybean performance on some soil types, particularly with early planting, and may enhance biological nitrogen fixation. Soil tests at both sites did not indicate a requirement for additional phosphorus or potassium, so no extra K was applied. Two replicated trials were conducted in 2025 near Elora and Winchester, Ontario.

Results

The Elora site demonstrated that a recipe approach can significantly increase soybean yield under favorable conditions. See *Table 1*.

Table 1. **Soybean Yield Response at the Elora Research Station.**

Variety	MAP (11-52-0)	Dry AMS (21-0-0-24S)	Fungicide	Planting	Yield	Gain
Adapted	-	-	-	May 20	75.1	
Long	-	-	-	May 20	75.8	0.7
Adapted	40 lbs/ac	100 lbs/ac	Delaro Complete	May 20	80.6	5.5
Long	40 lbs/ac	100 lbs/ac	Delaro Complete	May 20	80.2	5.1
Adapted	-	-	-	April 25	80.2	5.1
Long	-	-	-	April 25	83.3	8.2
Adapted	40 lbs/ac	100 lbs/ac	Delaro Complete	April 25	83.1	8.0
Long	40 lbs/ac	100 lbs/ac	Delaro Complete	April 25	85.2	10.1

*A yield difference of less than 2.7 bu/ac is not considered statistically significant.

Variety × Planting Date Effect

When planted early (April 25), the longer-maturity variety (Avalanche XF, 1.4 MG) yielded 3.1 bu/ac more than the adapted variety (Viper R2X, 0.8 MG)—83.3 vs. 80.2 bu/ac. However, when planted in the normal window (May 20), there was no yield advantage to the longer-maturity variety. This result reinforces that longer-maturity selection is very important when planting early to maximize yield potential.

Full Recipe Effect

Comparing the baseline (adapted variety planted May 20) to the full recipe (long variety planted April 25 + starter fertilizer + fungicide):

- 75.1 bu/ac → 85.2 bu/ac
- Gain: 10.1 bu/ac

These results demonstrate that a basic recipe can increase yield even when no obvious soil or plant deficiencies are present.

At the Winchester location, no significant yield response was observed from any treatment. This was due to the dry growing season in Eastern Ontario in 2025, which limited yield potential and response to inputs. When moisture is the main limiting factor, additional inputs often do not significantly change yield.



Ocelot E3 beside Typhoon E3 demonstrating the difference in 0.5 RM of maturity

< Table 1 Notes:

- The ‘adapted’ soybean variety used was Viper R2X (0.8 MG) and the ‘long’ was Avalanche XF (1.4 MG).
- Fungicide = Delaro Complete foliar fungicide sprayed at R2.5 at 237 ml/ac.
- Early planting at Elora was April 25. Normal was May 25.
- Soil test results for Elora were 7.2 pH, 4.1 organic matter, 26 ppm P, 150 ppm K.

Economic Analysis (Elora Site)

Assumptions:

- MAP: \$1,300/tonne
- AMS: \$800/tonne
- Delaro Complete: \$30/ac
- Total input cost: ~ \$90/ac (excluding application)
- Soybean price: \$14.00/bu
- Yield gain: 10.1 bu/ac

Revenue increase: 10.1 bu/ac × \$14.00 = \$141/ac

Net return: \$141 – \$90 = ~\$51/ac profit

Under favourable growing conditions, the recipe approach generated a meaningful positive return. However, results from Winchester highlight the importance of environmental risk and site variability.

Going Forward: Key Messages

1. Longer-maturity varieties provide the greatest advantage when planted early.
2. A modest, targeted recipe (early planting + longer maturity + starter fertilizer + fungicide) can significantly increase yield under favorable conditions.
3. Profitability is achievable, but environmental conditions strongly influence response.

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